

REVIEWS.

ART. XII.—*Operative Surgery.* By FREDERICK C. SKEY, F. R. S. With numerous wood-cuts. Philadelphia, Blanchard & Lea, 1851: 8vo. pp. 661.

THE title-page of this book very naturally suggests the inquiry, Who is Mr. Skey? Nor is the question one of mere idle curiosity. In the preface, he says, "It may be charged against me that I have expressed freely, and perhaps more authoritatively than I am entitled, my own individual opinions, and have made little reference to those of others. In answer to this charge, I have only to remark, that I do not profess to give the multitudinous opinions of other men, and yet I have not withheld them. I have quoted the opinions entertained by most of the eminent members of the surgical profession, so far as a general intercourse and an extensive acquaintance have enabled me to command it. The character of my mind is not attuned to authority, and it has been my practice, no less than my principle in life, to think for myself. A tolerably extensive intercourse with disease has led me to the opinions which I have embodied in the following work: I profess no more."

But, inasmuch as Mr. Skey appears in the character of a *teacher*, and speaks authoritatively concerning matters of the highest importance, we have a right to ask for some sign by which we may know him to be a true prophet, and not an impostor—one really commissioned to minister at the shrine of Apollo, and to interpret his oracles. Perhaps, modesty may have induced him to withhold his credentials, but for the information of his and our own readers, we must disregard his incognito, and announce him as *one of the assistant surgeons of, and lecturer on Anatomy to, St. Bartholomew's Hospital, London, and member of the Royal College of Surgeons of England.* He has, therefore, a right to our respectful attention.

The occasion and scope of this publication are thus declared by the author in the preface: "The following work was undertaken in compliance with the advice of some professional friends, who equally felt with myself the want of a book on operative surgery, which might become, not simply a guide to the actual operation, and embrace the practical rules required to justify the appeal to the knife, but would embody, at the same time, such principles as should constitute a permanent guide to the practitioner of operative surgery, and without which all claim to its scientific character is lost." In accordance with this manifesto, the author aims, throughout the book, to inculcate correct principles as the basis on which all operations should be predicated.

The volume before us is an American reprint of the London publication.

We do not design to pass in review all of the many subjects which Mr. Skey has embraced in his book—they are too numerous, for his list will be found to include, probably, all of the operations which a surgeon has occasion to perform. We shall, therefore, call the attention of our readers to some of those which seem to us to be most important.

The account of the particular operations practiced is introduced by some general observations on various interesting and important matters connected with operative surgery, as the *preparatory treatment*, and the *after-treatment*, the *etiquette of consultations*, the *individual responsibility of the operator*, &c.

The author's experience of *Chloroform*, also, is given at length, and the propriety and importance of employing it are unequivocally enjoined. His observations on this subject were quoted in full in the last number of this Journal, at page 498, and we need not repeat them now.

Mr. Skey is very earnest in impressing upon his readers the true relation which should exist between operative and medicative surgery; and his remarks are well worth an attentive consideration. The *cacoethes secandi* is not confined to London; there are, unhappily, itching palms everywhere, whose owners cannot, it would seem, overcome the desire to employ them in this heroic manner. The scalpel to them, like the weird dagger to the murder-plotting Macbeth, becomes instinct with a fatal and irresistible eloquence, impelling them to action, and marshalling them the way; it whispers to them the profit and renown which the deed will create for them, and fills their "heat-oppressed brain" with crimson glories; it presents itself to them, its handle towards their hand, inviting their clutch; and, finally, despite their conscience, or their conscience lulled to sleep, they do the deed. To such we commend Mr. Skey's teachings.

In the *second chapter*, the *Implements* of the surgeon are described and commented on, together with the proper modes of employing them.

It is impossible, of course, and unnecessary, to bend to a single uniform rule the multiform tastes and fancies of surgeons with regard to the dimensions and shapes of their knives, and their methods of holding and using them. Each one must be allowed to suit himself in these particulars. Many operators will, we doubt not, approve of the knife which Mr. Skey prefers, and will find, too, that they can employ it most advantageously by wielding it as he advises; while others will choose an instrument differently shaped, and will handle it otherwise.

He recommends very strongly the use of a *silver blade*, whenever, in the progress of an operation, it is of importance to avoid giving rise to the effusion of much blood, and thereby obscuring the part which is being operated upon. "Whether for the exposure of large arteries, or the removal of large tumours, or in hernia, the escape of blood is one of the chief obstacles to the progress of the operation; and when the quantity is large it ceases to be a mere inconvenience, and becomes a serious evil. Much bleeding from small vessels may be avoided by the use of a blunt knife, which lacerates coarsely, instead of minutely. I was indebted to Sir Benjamin Brodie, in the early part of my own career as an operative surgeon, for this useful hint; and I have seen the benefit derived from the employment of a knife with a silver blade, too frequently, to hesitate in recommending it as a valuable appendage to the operating case"—p. 46. Accordingly, in the following pages, the author very frequently directs the use of this instrument. Some other surgeons advise it also. Probably, it will be well for those who are just commencing to operate, to adopt this safe advice; but when self-confidence has been acquired by familiarity with danger, we cannot see the advantage of resorting to an expedient which involves some loss of time and bungling; excepting, perhaps, when operating upon parts in which there is extreme liability of doing serious mischief by the employment of the common scalpel. But, as we said before, let each one, in this matter, judge for himself.

This chapter contains many very sensible and practical remarks concerning the direction and the manner in which *incisions* and *dissections* should be made, the preparation of the divided parts for the subsequent dressings, and the treatment which is most conducive to the healing of wounds thus made. We are particularly pleased that Mr. Skey objects to the fierce and uncompromis-

ing onslaught which the late Mr. Liston made upon *poultices* and *adhesive plaster*. We agree with Mr. Skey in condemning the application of the poultice as an *exclusive* article of dressing when warmth or cold is demanded; in very many cases, perhaps as a general rule, we should prefer the topical employment of water, simple or medicated; but we do most unhesitatingly contend that the latter is much inferior to the former, when it is desirable to *maintain a uniform temperature for a length of time*, as, for example, for the purpose of promoting the maturation of an abscess. And, moreover, in hospital-practice, and among our poorer patients, who cannot command constant and kind attendance, the poultice cannot rationally be dispensed with in favour of the water-dressing, not even during the daytime, and far less at night. We concur with the author, also, in the opinion that Mr. Liston's "isinglass plaster, fails in giving the support obtained from the common adhesive plaster spread on linen;" and, as to the greater probability that *erysipelas* will be induced by the latter, rather than by the former, in any situation, we do not believe it; we have used the adhesive plaster in innumerable cases, in hospital-practice and in private, and we cannot recall a single instance in which such a result followed.

Mr. Skey concludes this chapter by devoting a page and a half to the subject of *tetanus*, on which he throws no light whatever, but rather renders our lamentable darkness still more hopeless, by the assurance that "anæsthetic agents, which are invaluable in their power to arrest suffering, possess not the slightest power in contending against the disease itself" (p. 67), as he discovered during the treatment of a recent case of *tetanus*. He makes no mention, moreover, of the occasional cures which have followed the employment of tobacco, cannabis Indica, the hot-bath, counter-irritation along the spine, &c. We think that it would have been far better for Mr. Skey not to broach the subject of *tetanus* at all, inasmuch as it forms no necessary part of a treatise on operative surgery, and because his limits are too circumscribed to permit of any waste upon extraneous matters. But, since he has thought it proper to treat of this affection, we regret that he has not, for the benefit of those who may make his volume a reference-book, been more precise in his description of its symptoms, and more communicative concerning its treatment; and as the establishment of correct principles of treatment is a prominent aim of his labours, some remarks concerning the most received *pathology* of this disease would have been very appropriate.

In his Lumleian lectures for 1849 (vid. *London Medical Gazette*), Dr. Todd gives some very instructive views upon the nature and treatment of this terrible malady. He thinks that it is due to an altered state of the blood, induced either by the introduction into it of some poisonous material from without, as in *endemic tetanus*—or by some general vitiation of the nutritive processes, as is illustrated in the *idiopathic* variety—or, finally, by a morbid action occurring in a wound, as in *traumatic tetanus*. The blood, thus changed in its physiological properties, produces a modification of the nutrition of the spinal cord, and thereby occasions an "exalted polarity" of this tract—a state which, in some cases of traumatic tetanus, may be communicated by an inductive process from an irritated nerve in the wound. His opinions derive support from the similarity which exists between this disease and trismus infantum, laryngismus stridulus, and the artificial tetanus produced by strychnia. The symptoms are certainly not *dependent* upon congestion or inflammation of the spinal cord; for, although these states are sometimes found both in idiopathic and in traumatic tetanus, yet cases often occur in which they are entirely wanting; we have met with two instances of this kind, in a very

limited number of cases. Dr. Todd says, "I have examined, with the most scrupulous care, the spinal cords of rabbits which died in strong tetanic convulsions, kept up for some time after large doses of strychnine; but I could not discover, even with the highest powers of the microscope, any indication of deranged structure." And he draws from his investigations of the subject the following inferences: "1. To support the strength of the patient as much as possible, so as to oppose the exhausting effect of the convulsive paroxysms," inasmuch as death takes place, he thinks, not usually from any disorganization of important organs, or from the arrest of functions essential to life, but from gradual exhaustion; "2. To remove all possible sources of irritation or of depravation of the blood, in vitiated secretions, bad diet, impure air; 3. To diminish and reduce the exalted polarity of the nervous centres to their normal condition, and, if possible, to effect this by means which will not reduce the powers of the patient." The third indication has hitherto baffled our efforts, and Dr. Todd thinks that this has been partly owing to the fact that our treatment has been entirely empirical, and that no systematic plan has been persevered in, in a sufficient number of cases, to permit us to arrive at any legitimate conclusion, excepting perhaps in the instance of opium, which has failed signally. He recommends the application of *cold to the spine*, and the *inhalation of Chloroform*. The former he advises from his own experience of its value; it should be employed in the form of *ice contained in ox-gulleys placed along the spine*; its effects should be most carefully watched both in order that it shall act sufficiently, and that it shall not produce too sedative an influence upon the heart. He has had no practical acquaintance with the operation of chloroform in tetanus; but from the facts that it has been successfully used in a few instances, and that it has prolonged life and annihilated sensation for a considerable time in many others, he is strongly induced to believe that, when its effects shall have been more carefully studied, and the rules for its administration more accurately established, it will be found to be one of the most reliable remedies which we possess. Its influence upon the action of the heart should be well watched.

In his recent treatise on "General Pathological Anatomy," vol. i. p. 153, M. Cruveilhier throws out a suggestion which may in some cases prove efficacious, as it did in an instance which came under his own observation. He thinks, as is usually taught, but contrary to the opinion of Dr. Todd, that death in tetanus is due to *spasmodic* closure of the glottis producing apnoea. Accordingly, in the case alluded to, he directed the patient to make *permanent efforts at voluntary action* of the respiratory muscles, at regular, natural intervals; the patient, being "full of energy and courage," did so, and recovered. In another case, this plan failed; but the man was not willing, or was unable to follow the advice given him. When his recovery was despaired of, however, "cool baths with cool, and subsequently cold, affusions were employed several times in the day," and he recovered.

The *third chapter* treats of *Dislocations*. Of this class of affections Mr. S.'s definition is defective. He says, "By the term dislocation is understood a displacement by violence of any part of the osseous components of a joint from the remainder"—p. 68. But to restrict thus the signification of the term is to exclude from the category of luxations all those cases of displacements which occur "*spontaneously*," i. e. by some change having been produced in the surfaces of the parts composing the joint, either before or after birth.

Cruveilhier's definition of the term luxation is the most comprehensive, and at the same time the most philosophical, which we remember to have

seen: "A luxation exists at a joint, when the articular extremity of one of the bones has become so displaced that the contraction of the muscles cannot restore it to its normal position."—Op. cit. p. 395.

Before treating of individual dislocations, Mr. Skey considers the *principles* which should guide us in their management, and combats "certain opinions and a generally adopted practice which, in his judgment, are erroneous." He wishes to impress upon his readers the idea "that the muscles are the immediate agents of reduction, and not the surgeon, whose entire duty consists in placing the bone in a position to give them the opportunity of displaying this harmony of action, and of exercising a power even beyond that of the mechanical agents of extension." In this he is undoubtedly correct, and we did not suppose that any well-informed surgeon entertained any other opinion, excepting with reference to dislocation of the clavicle, some of the bones of the hand and foot, and others, upon which the muscles exert little or no influence in retaining them in their articular connections. The anatomy of the joints, in fact, will show in what cases this rule is departed from, and will account for such departure. For instance, the construction of the shoulder and hip-joints is such as to admit of very diversified and extensive motions of their respective limbs: the head of the humerus and of the femur are much exposed to dislocation from direct violence applied, and from the action of the powerful muscles which move them; yet the ligaments of these articulations are comparatively feeble, few in number, and so lax as actually to permit the articulating surfaces to separate from each other. But this defect, as it seems, on the part of the ligaments is compensated by the strength of the muscles which immediately envelop the joints, and which, acting upon the bones in all their motions, constantly guard against dislocation. Even in dislocation their conservative aim and tendency are manifest, although now, in consequence of the new position of the head relatively to its socket, the axes of contraction of the muscles with reference to these two points are also changed, so that their effect is reversed, and they tend to perpetuate the displacement, instead of approximating the parts of the joint. So soon, however, as, in the attempt at reduction, their original line of action is restored, by the more favourable position of the head of the bone, they again perform their natural office and draw the latter into its proper receptacle. Therefore, in a case of luxation at one of these joints, the surgeon cannot suppose that by his extension and other manipulations *he* actually restores the dislocated bone, for he must see, at a glance, that if he should continue these efforts after the head had reached a certain point, he would defeat his own aim, and would separate the articulating surfaces farther and farther from each other; accordingly, at this point he wisely ceases his tractions, or the muscles overcome them, and the dislocation is reduced, the bone being drawn in a direction contrary to that in which he has been operating.

But this mechanism of restoration does not apply to dislocations of the clavicle and some other bones, as before mentioned. Here the ligaments are numerous, comparatively, if not absolutely, much stronger than those of the other joints alluded to, and are in fact the real guardians of the articulations; while, on the contrary, the muscles which are inserted into their vicinity tend by their contraction rather to produce displacement, so that the surgeon must not only restore the bone to its proper place, but must also retain it there, by mechanical appliances, until the ligaments shall have regained sufficient strength to enable them to resist effectually the disturbing force of the muscles.

While we admit, then, with the exceptions specified, the correctness of the
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principle for which Mr. Skey contends, we cannot agree with him in the inference which he draws from it; viz., that the reduction of a luxation may not be *facilitated* by rotation or other movement impressed upon the head of the bone, in addition to the direct extension which is made upon it. We will cite as a case in point the one which he quotes as having occurred in his own practice, in which the head of the femur was thrown upon the pubis: he says (p. 118), "It was proposed by my colleagues to draw the head of the bone backwards, but chiefly outwards, by a side towel. I expressed my doubt as to the probability of success, and the attempt proved that I was right. The error consisted in the direction in which the extending force was being made; the principle was bad. The case was then given into my charge, and I made extension downwards and a little outwards." In this manner he succeeded in accomplishing the reduction. But if his colleagues and he himself had, *in addition to the "extension downwards and a little outwards,"* passed a roller under the upper part of the thigh and elevated the head of the bone a little, *at the same time that extension was being made,* as Sir A. Cooper advises, we think that the restoration would have been effected sooner and with more ease both to the patient and to the surgeon. Such expedients may, we think, be often resorted to as *adjuvants* to direct extension, but not to the exclusion of the latter.

One of the most interesting questions connected with the subject of dislocation regards the reducibility of *old* luxations. Concerning this, Mr. Skey remarks, "It is impossible to lay down any positive rule with regard to the time beyond which an effort at reduction should not be made, unless we carry the question at once into a period of nine months, or a year or more; because, although our success may be improbable, the attempt is worth making, provided it be carried into effect with discretion, and it is very rarely that injury is sustained by the attempt, however painful or long continued; indeed, it is often followed by increased freedom of movement afterwards. Sir A. Cooper objects to efforts being made to reduce dislocations of long standing, and he has endeavoured to define the period at which the attempt may be made. He gives *two months to the humerus, and three months to the femur.* It would appear that the increase of difficulty in the attempt to reduce a bone dislocated three or four months arises rather from the increase of strength and firmness of the fibrous adhesions formed around the end of the dislocated bone, than from the condition of the muscles, which have probably attained their fullest degree of inorganic contractions, and have become partly absorbed at the end of two months"—p. 73. The existence of new growths in the old cavity he considers an obstacle of much less moment.

Now, we think that these observations are very well calculated to mislead those who may refer to this book as a guide in such cases, both as to the facility with which old dislocations may be reduced, and as to the propriety and expediency of making an attempt at their restoration. And the dangerous tendency of these opinions is much increased by the following paragraph: "The immense experience of Sir A. Cooper has failed to furnish a single case of serious injury consequent on the attempt to reduce any form of dislocation. He speaks, indeed, of contusions of the muscles, and lacerations of the skin, and insensibility of the arm; but no instance of serious injury is recorded, to awaken fear or distrust in the mind of the operator, or to create an alarm lest the effort should prove seriously detrimental to his patient"—p. 74. If Mr. Skey had but refreshed his memory and his judgment by the perusal of the opinion which Sir A. Cooper actually did express in the premises, he would have found that that distinguished surgeon did not entertain such views of

the trifling amount of danger connected with the restoration of long-standing dislocations as those which we have just quoted. But he expressly says, "I believe that *much mischief* is produced by attempts to reduce dislocations of long duration in very muscular persons. I have seen great contusion of the integuments, laceration and bruises of muscles, and tension of nerves, inducing an insensibility and *paralysis* of the hand, occasioned by an abortive attempt to reduce a dislocation of the shoulder; so that in such cases, even when the bone has been replaced, it has often proved rather an evil than a benefit from the violence of the extension. I have also heard of cases occurring in the practice of others, in which the *whole side of the trunk became paralyzed* from injury to the cervical vertebrae during a violent extension: and of more than one instance in which the *axillary artery was ruptured*; and some of these cases were fatal. And there are plenty of cases on record of *fatal abscesses*, from violent attempts at the reduction of dislocated hips. Mr. Skey has mentioned a *fatal case of phlebitis* following protracted extension of a dislocated hip, during which one hundred and twenty ounces of blood were taken from the patient." (A. Cooper's *Treatise on Disloc. and Fract.* Am. ed., p. 68.) He further says, "I am of opinion that *three months after the accident for the shoulder, and eight weeks for the hip*, may be fixed as the period at which it would be imprudent to make the attempt at reduction, except in persons of extremely relaxed fibre, or of advanced age." (Op. cit. p. 69.) It would be very easy, although unnecessary, to cite other instances in which permanent injury or death has followed such attempts; sufficient evidence has been adduced to show that Mr. Skey has spoken with unwarrantable carelessness concerning this question, and that his own experience is entirely at variance with his assurances as to the absence of danger from the operation.

We agree with the author in the opinion that no definite time can or should be fixed, beyond which an attempt at the reduction of a dislocated bone should not be made. It is not so much a question of time, as of the condition of the new and the original resting-places of the disarticulated end of the bone. But his book affords no information to the inquirer as to how he may learn whether or not certain changes have occurred in the parts concerned, which render an attempt at restoration feasible, or objectionable, or decidedly improper. We apprehend that, as it is impossible to ascertain with certainty the condition of the new and of the old joints, the suggestion of Mr. Bransby Cooper will be found to be the most reliable in practice. This gentleman says, "Should not the principal consideration be, the condition of the new joint, especially as to the degree of motion of which it is capable? for by this a fair judgment may be formed as to what extent nature has altered the surfaces of the bones in contact to fit them for the functions of a joint in their new situation. If any useful motion can be performed, then I believe it may be considered as ill-judged to attempt to restore the dislocated bone to its former articulating cavity, for it seems invariably to happen that, as a new joint becomes fitted for use, so the structures of the old one are rendered incompetent for restoration. Nor do these changes depend so much upon time as upon the attempts which have been made to use the supplementary articulation: for if an unreduced dislocation be maintained in a state of perfect rest, the changes which take place are very slow, and in such cases months may elapse, and yet it may be quite proper to attempt reduction; while, on the other hand, if continued efforts have been made to employ the limb, and a useful motion acquired, more permanent injury is likely to be sustained by restoration of the bone to its original situation than if it be allowed to remain and means are employed to perfect the adaptation of the newly-formed structures." (Ed. Sir A. Cooper,

op. cit. p. 69.) The objection on the score of pain inflicted on the patient is no longer a necessary element in the consideration, but the dangers above enumerated are at least not diminished by the use of anæsthetic agents; they are rather increased, because we are deprived, by the patient's insensibility, of the information which his protective and defensive sensations might otherwise afford us, as to the probable or actual infliction of injury.

The reader will find a very full and satisfactory account of the anatomical conditions of the old and new joints in unreduced dislocations, in the volume of Cruveilhier before cited.

Mr. Skey has omitted all mention of the assistance derivable, in such cases as those we have been considering, from the subcutaneous section of the ligamentous, tendinous, and other recent or original structures by which the restoration of the bone is opposed.

We must pass over the author's observations on individual luxations; they are full, and in the main correct, and may be consulted with advantage.

Nor shall we make any comments on the chapter devoted to the subject of bandaging, but proceed to that on *fractures*. As in the chapter on dislocations, so in this, the remarks on individual fractures are preceded by some general considerations applicable to this class of injuries.

Mr. Skey devotes some space to the question as to the influence of the muscles upon the direction and degree of the displacement of the fragments of the bone. He very properly, as we conceive, contends that the character and direction of the displacement depend first upon the mode of action of the violence which produces the fracture, by which the fibres of the bone are ruptured in a certain direction; and, secondly, upon the sudden contraction of the muscles inserted into the fragments, occurring synchronously with the fracture. We think it highly probable that, in the case of oblique fractures produced by indirect violence, as, for example, of the femur by a fall upon the foot, the particular direction of the obliquity is due to this synchronous spasmodic muscular contraction, one set of muscles, or one muscle, predominating over the others in power, and that the consequent displacement is occasioned, and its direction determined by the same agency, aided, of course, by the continued action of the extraneous force. We cannot, by any other supposition, so satisfactorily account for the fact that in different instances the direction of the fracture will be different, the cause, and, so far as we can ascertain, the mode of its operation, being the same in all. Mr. Skey admits, "the shortening of the limb in fractures is, without doubt, owing to the action of the muscles immediately consequent on the accident; but I contend that this violent action does not continue, as in the case of a dislocation, and I doubt very much whether it is the cause of the prominence of the upper end so frequently found. From the period of the accident, however, if neglected, the muscles of the limb commence a process of slow retraction, which will extend over many days, and even weeks, as occurs in some rare examples of fracture of the neck of the thigh-bone, without early symptoms"—p. 143. Now, as to the *duration* of the muscular contraction, we apprehend that it will continue so long as the muscles concerned are sensible of the existence of a resistance to be overcome, in order that they may assume the greatest degree of shortening of which their fibres will admit, or until their action is opposed by an amount of resistance which they cannot overcome, or until their contractility is exhausted. The obstacles against which they have to contend are the weight of the portion of the limb to be moved, in some instances the impacted state of the fragments, the resistance offered by those fibres of the muscular, ligamentous, and other structures which remain attached to both

fragments of the bone, the opposition of other muscles, &c.; these impediments being so various in degree in different cases, the effect of the antagonistic muscular contraction must be equally uncertain. The reason why the power of the muscles is so much greater in opposing the restoration of a dislocated than of a fractured bone is, we presume, not that there is any difference in their mode of action in the two cases, but that in the latter *some of the muscles* only act upon the lower fragment, while in the former *all the muscles* are called into full contraction, as well those which immediately surround the joint, and which, though short, are exceedingly powerful in the result of their operation, as those which are inserted into the distal extremity of the bone, and even into adjoining bones, and which are remarkable for the extent of their shortening rather than for their contractile power. With regard to the author's doubt, as to the influence of muscular action in producing the projection of the upper fragment of a broken bone, we can see no reason for it; we think that the facts of anatomy, as well as of surgical practice, are against it, and in favour of the positive and decided influence, upon the upper portion of the bone, of the muscles which are inserted into it. He says, "In the case of the thigh, for example, there is no muscle so attached to the bone as to elevate the upper fragment in any other direction than that inwards, for the long muscles of the limb have lost their influence in consequence of the solution of continuity of the bone, on which they have hitherto acted; and of the muscles connected with the upper half, we have none but the triceps, which can only act by distorting the line of the bone in the direction upwards and inwards. It will be recollected that the rectus, in front, passes beyond the fracture, and the cruræus and vasti arise from the upper part of the femur; and cannot, therefore, influence its movements, while the flexors, behind the bone, extend below the fracture to form the hamstrings, and can, of course, only operate on the lower portion. In fracture high up, the psoas and iliacus exercise no influence in elevating the upper end"—p. 142. And at p. 168, "It is an error, not merely common, but almost universal, to attribute the flexion of the thigh on the pelvis to the psoas and iliacus muscles, which have really no influence whatever in raising the leg, as I have proved by experiment to my own satisfaction and to that of others. This action of the limb is effected entirely by the rectus femoris; else, whence the benefit of raising the thigh on the pelvis in fractured patella?" Undoubtedly, the rectus femoris does flex the thigh on the pelvis, but it is not the only muscle which produces this effect; and the situation of the combined psoas and iliacus, their origin and insertion, and the authority of the best observers, as Cruveilhier, Quain and Sharpey, and Theile, for example, induce us to believe that it also flexes the thigh on the pelvis, or the pelvis on the thigh, according as the fixed point is taken on the one or the other. It is fair to infer, therefore, that in the event of a fracture separating the upper part of the thigh-bone, just below the trochanter minor, from the lower, the superior fragment may be tilted upwards by the action of this double muscle; and we have seen this deformity occur, as others have seen it also. Malgaigne states that, in the preparations of the seventeen cases of fracture of the femur at its upper third, which are contained in the Musée Dupuytren, this projection forwards of the lower extremity of the superior fragment is observed in ten. (*Traité des Fractures*, p. 717.) The deviation is not, in general, great, because the muscular action is limited by some or all of the obstacles before mentioned.

But there is another displacement of the upper fragment, which is much more commonly observed than this, as a consequence of fracture at the upper third of the femur; and we are surprised that Mr. Skey has not observed it

repeatedly, and called attention to it in this book. We allude to the projection laterally, or upwards and outwards, of the superior portion of the bone, produced by the combined operation of the psoas and iliacus and the anterior glutei muscles, particularly. The recognition of this deviation, and the counteraction of its effects, by proper position of the limb, is essential to the restoration of the bone to its proper form, length, and strength. A very beautiful illustration of this particular deformity is exhibited in Fig. 2, Pl. XIII. of the atlas which accompanies Maligne's *Treatise on Fractures*.

In view of these facts, which establish the influence of the muscles on the direction of the displacement after fracture—and this influence is exerted upon other bones as well as upon the thigh—we must entirely dissent from the opinion of the author that, "when the splints are properly applied, it is of little moment in what position the limb is placed"—p. 147. For example, in a fracture of the femur at its upper third, with the external angular deformity of which we have just spoken, it is by a proper position only that a perfect cure can be gained; pressure by means of compresses laid upon the projection, as is generally recommended, will not answer, but the lower fragment must be so placed that its axis shall correspond with that of the upper.

Mr. Skey's remarks on the mode of reducing fractures, and the apparatus employed to maintain coaptation, and those referring to compound fractures, are very good. We should prefer to have seen more importance attached to *position* in the treatment of this class of injuries, and less to the mere mechanical force exerted by compressing and extending apparatus. He gives a description and an illustration of an extending and counter-extending agent of his own device, which we should be very unwilling to employ (p. 149); for, although it is ingeniously contrived, and perhaps sufficiently powerful to accomplish the purpose for which it was constructed, its practical operation upon the living parts must, we fear, be injurious, from the great and circumscribed pressure which it will necessarily produce upon them.

The author's comments upon particular fractures need not detain us; they are based, of course, upon the general principles which he lays down for the treatment of this class of accidental lesions, and in some respects, therefore, we differ from him. But we can, nevertheless, recommend them to the study of our readers, as containing abundance of valuable suggestions, and as calculated to awaken improving reflections, even where they seem objectionable.

We pass to the sixth chapter, "*On operations for Aneurism, and for tying wounded or divided Arteries*." As in the preceding chapters, we have a preliminary discussion of generalities relating to these subjects, and subsequently the application of these principles to the treatment of particular aneurisms; the whole occupies one hundred pages of the volume, an allotment worthy of the importance and interest of these affections.

As closely appertaining to aneurism and wounds of arteries, the author briefly points out the anatomical and physiological properties of the arteries, the method which nature employs to arrest hemorrhage, the *ligature*, its mode of operation, and the manner of applying it.

It is not to be supposed, of course, that Mr. Skey has intended to give anything like a full and complete account of aneurism; such a dissertation would not be at all necessary to the perfection of his plan, and his limits would not admit of it. We presume that his aim has been to point out so much of the history and pathology of this disease or morbid condition as will enable his readers to treat it intelligently. We think that he has accomplished this object very satisfactorily, and that this preliminary sketch will materially assist the student in his efforts to cure the formidable lesions which it is intended to in-

roduce to his contemplation. There are a few points of pathological interest, however, in which the text is not strictly accurate, and one or two others of more practical moment in which it might with advantage have been more full and explicit.

With regard to the *etiology* of aneurism, it is stated, at page 176, that "the arterial tubes are subject, among other diseases, to a morbid change in the structure of their coats, by which the vessel becomes dilated, and is no longer competent to its functions." This is, so far as we have observed, the only cause assigned. By the expression, "*a morbid change*," the author may mean, it is true, any or all of the alterations or lesions of structure to which the coats of the arteries are liable, whether they originate in abnormal modifications of nutrition, or the result of injury or violence. But we infer from the general tenor of the text that he refers to the common forms of degeneration of the arterial walls, the semi-cartilaginous, atheromatous and calcareous. We object to the author's statement because it is not altogether correct, and because it only reveals a fraction of the truth as to the causation of the aneurismal tumour. From the statistical tables which have been framed by many writers on the diseases of the arteries, it seems that there is a great want of correspondence between the occurrence of the degenerations in question and aneurism, as respects the sex and age of the patients, and the favourite seats of the two affections. Thus, according to Bizot (*Mém. de la Soc. Méd. d'Obs.*, vol. i.), *atheromatous* and *calcareous degenerations* are found in the different arteries, excluding those of the cavities of the body, in the following order of frequency: the posterior tibial, internal carotid, anterior tibial, perineal, subclavian, coronary, popliteal, crural, common iliac, radial, innominata, brachial, axillary, ulnar, facial, common carotid; while by the table of Mr. Crisp (*Diseases of Blood-vessels*, p. 113), *aneurism* affects the arteries in the following order: the thoracic aorta, popliteal, femoral, abdominal aorta and its branches, carotid, subclavian, innominata, axillary, external iliac, cerebral, pulmonary with the common iliac, gluteal, and posterior tibial, temporal with the ophthalmic, subscapular, and brachial. We find also that the male sex is more frequently afflicted with aneurism than the female, in the proportion of rather more than seven to one (Crisp), while the two sexes are about equally subject to the arterial degeneration. The last-named condition is found very much more commonly than the other to affect the vessels symmetrically. (Bizot.) As old age advances, the fatty and calcareous depositions become more and more constant: "Each morbid phenomenon," says Hasse (p. 82), "progressively increases in frequency and extent, with the age of the subject;" while of the 551 cases of aneurism counted by Mr. Crisp, almost three-fourths occurred before the age of fifty. Admitting, therefore, that the change of structure of the arterial coats is a predisposing cause, other agencies must be operative in the production of aneurism, as violent and laborious exercise, sudden extension of a limb which has been flexed, direct injury inflicted upon the vessel, &c.

In the sentence which we have just quoted, Mr. Skey has manifested a certain carelessness in composition, such as we have remarked in many other pages of his book, which, if the passage were literally interpreted, would convey a very incorrect idea of the causation of an aneurismal tumour. He speaks of "*a morbid change in the structure of their coats (of the arteries)*," by which the vessel becomes dilated," as though the morbid change were the agent in the production of the dilatation. He means to teach, we have no doubt, that the change of structure induces a corresponding modification in the vital properties of the arterial walls, in consequence of which the tube loses the resiliency which enabled it to regain its original calibre after

having been distended by the influx of blood from the heart, and by the constantly recurring action of this disturbing force, gradually attains the increased dimensions which it possesses. Indeed, in another paragraph, he says, "the tendency in an aneurismal tumour to increase in size is due to the actions of the heart, which operates on the diseased coats of the vessels with sufficient force to maintain an uninterrupted enlargement in the volume of the tumour." But the pathological errors contained in the continuation of the same paragraph can scarcely be so easily excused: "Against this mechanical force we have the influence of absorption, the *vis medicatrix*, or what may be termed nature's indisposition to disease. If these two powers are equally balanced, the disease would remain unaltered; but the force of the heart usually predominating, the tumour increases. If that force, however, be reduced in degree, and, without being destroyed, if it be brought within the influence of the *vis medicatrix*, the tumour will be gradually absorbed"—p. 176. It seems to us that Mr. Skey has lost sight of the fact that, in the formation of an aneurismal tumour, a process of *growth*, as well as of dilatation, takes place—of growth of the walls of the artery whereby they are rendered thicker and thus enabled to resist for a longer time than they otherwise could, the *thinning* effect which dilatation of the vessel, uncounteracted by growth, would necessarily produce. And it is in and by this very process of growth that the *vis medicatrix naturæ* manifests its preservative tendency, not by "*absorption*," for by this the walls of the aneurismal sac would be rendered more and more thin and delicate, and the occurrence of rupture and fatal hemorrhage hastened instead of retarded. The walls of the sac continue to grow, keeping pace with the increasing enlargement of its cavity, until their "*reserve power*," as Mr. Paget very happily terms the recuperative and conservative element which nature gives to every structure, and organ, and tissue, has become exhausted; then, as the cavity of the tumour enlarges, the coats of the artery become thinned, and finally give way. But, to guard against this, certain phenomena are, meanwhile, taking place within the sac. Of these Mr. Skey speaks—not very fully, indeed, but sufficiently to show that efforts are made to fill up the sac more or less completely, and thus to cure the disease.

With reference to the *spontaneous cure* of aneurisms, the author says, at page 180, "This end is effected most frequently by the sloughing of the tumour, which process may possibly be the result of increasing pressure on parts not very fully organized. The whole tumour undergoes a change of colour, loses its vitality, and eventually separates, leaving the artery *pervious* to blood"—(he certainly must have omitted, unintentionally and unknowingly, the syllable *in* before the word *pervious*). "Sometimes," he continues, "the sac is attacked by suppurative inflammation, and the entire mass is converted into a large abscess;" (he has again *forgotten*, as we hope, for his own sake, to put a plug of organized fibrin into the artery leading to this "large abscess;") "and thirdly, the contents of the sac, already partly solid, may become entirely consolidated, the entrance of any additional quantity of blood being precluded by the blocking up of the orifice, and the tumour becomes gradually absorbed."

We pass over the author's remarks on the *diagnosis* of aneurism, those concerning the application of the ligature, and the treatment subsequent to the tying of the artery. He has omitted any recommendation of preparatory treatment, a measure, we should suppose, which would materially conduce to the happy issue of the operation upon any of the larger arteries.

Mr. Skey devotes three pages to comments upon, and a description of, the mode of treating aneurism by *pressure*. He has not practiced this plan of

treatment himself, but thinks that, "notwithstanding the occasional objections attendant on the application of pressure, as the agent of cure in the treatment of aneurism, a sufficient amount of success has already attended the experiments that have been tried, to warrant the hope of a useful, if not a brilliant career, for this remedy, when additional experience has divested it of its objections"—p. 192. The objections which he adduces, are the *pain* protracted through the whole period of treatment, and the difficulty, in many cases at least, of avoiding pressure upon the accompanying nerve or vein. But these objections are comparatively trifling, indeed absolutely so, if the pressure be well managed with a proper instrument. And we think that, in estimating the merits of a new plan of treatment, of one too which does away, in a great measure, with a serious operation, the statements made concerning it, and the method and instruments recommended, by those with whom the plan has been most frequently and successfully carried out, should be carefully and implicitly attended to, before any doubt or opposition is pressed. The surgeons of Dublin have the high honor of having been the first, in modern days, to resort to this bloodless procedure. For some reason or other, whether from personal, professional, or civic jealousy, or from other motive, their efforts have been opposed and derided by many other surgeons, particularly by some in Edinburgh, as may be seen in the medical journals of the latter city.

By comparing the statistical table published in the *Dublin Quarterly Journal* for August, 1846, with that given by Dr. Norris in the *Am. Journal* for October, 1849, we have a record of 43 cases of aneurism treated by *compression*. Of these, 34 were of the popliteal, and 9 of the femoral artery; 37 were cured by pressure; in three others, all femoral, the pressure was relinquished, and the cure was completed by ligature. Only one died during the treatment by compression, and that of disease of the heart, the pressure having been maintained twenty days, until all pulsation had ceased in the sac; forty-eight hours after the compressor had been withdrawn, the person died suddenly. In one case, after compression had been continued for some time, in consequence of some pulsation remaining, a galvanic current was passed through the sac; in seven days the patient was attacked with erysipelas, of which he died in six days. In another, the pressure had been instituted a fortnight, when, at the request of the patient, the artery was tied, and the aneurism cured. Descriptions of the instruments most in vogue in Dublin, and which have been found most available, may be found in the medical journals published in that city, particularly in the *Medical Press*.

The duration of the compression varied very much, from ten and a half hours in one, to one hundred and six days in another; the average time of treatment in thirty-four cases, in which the time is specified, having been rather more than thirty days.

In the number of the *American Journal* before alluded to, Dr. Norris presents a table of the statistics of mortality, after *ligature* of the femoral artery for femoral and popliteal aneurisms. "Of the 204 cases contained in the tables, 50 died. Of these, 23 died from mortification of the limb; 8 from hemorrhage; 5 from phlebitis; 3 from tetanus; 2 from hectic and diarrhœa; 1 from thoracic inflammation and abscess in the course of the artery; one from sloughing of the sac; one from the bursting of an aneurism of the aorta within the pericardium, twelve weeks after the operation; 1 from fever; 1 from absorption of pus; and in 4 the cause of death is not noted." And six of the patients who recovered underwent amputation in consequence of gangrene of the limb. Of 128 cases which were cured, and in which the ligature came away from the vessel spontaneously, after a specified time, its average stay was twenty-one days and rather more than two hours.

Here, then, the surgeon has the means of comparing the results of the two modes of treatment, and of deciding between them.

The reader will find Mr. Skey's observations on "operations on wounded arteries" to be very excellent; we would particularly ask their attention to what he says concerning the hæmostatic virtue of *fresh air* in the case of bleeding from small vessels.

We cannot attempt to criticize specially the author's account of the mode of tying particular arteries for the cure of aneurism. We are happy, however, to be able to state our impression that the operations which he advises are, in general, judicious, and that his anatomical teachings are strictly correct. There are but one or two points on which we have a few remarks to make, concerning the text.

At page 204, the author says, "Aneurism of the arteria innominata consists in a simple dilatation of the artery, involving its three coats in a greater or less degree; but it contains no coagulum, for it is a dilatation of the entire vessel;" and further on, "Aneurism of the aorta is not a dilatation of the vessel, nor a true aneurism; but a false aneurism, in which the sac communicates with the vessel by a contracted opening, through which blood enters and coagulates," &c. In these sentences, there are several very inaccurate statements into which Mr. Skey has fallen, simply from a disposition to make certain cases stand as types and standards for a class, and which he would have avoided, had he consulted the opinions and facts adduced by other investigators. Aneurism of the innominata artery, though frequently, is not always a *simple dilatation* of the vessel; it is often a true aneurism, the walls being constituted of all the coats; sometimes a true aneurismal pouch may be engrafted upon a general dilatation of the artery; sometimes the dilatation of the tube is limited to a portion of its walls. Again, it is not a constant truth, that the aneurism in question *contains no coagulum*. We refer, in confirmation of our assertions, to the "Catalogue of the Patholog. Specimens contained in the Museum of the Royal College of Surgeons," recently published, vol. iii. pp. 258-260.

With regard to his opinions concerning aneurism of the aorta, they are equally with the others erroneous. Dr. Hope says, in his admirable treatise on the Diseases of the Heart, &c. (Am. ed. p. 396), after detailing the facts which demonstrate the existence of *true*, in contradistinction to *false*, aneurism of the aorta, "These proofs have of late years been so frequently verified by dissection, that the reality of aneurism by dilatation of all the coats of the artery is no longer problematical. Almost all the aneurisms of the ascending portion and the arch are originally of the true species, but the false is sometimes engrafted upon them;" and he refers to a case corroborative of these statements. In the catalogue just quoted, descriptions of aneurismal dilatations and of true aneurisms of all portions of the aorta, from its origin within the pericardium to the end of its arch, may be found (pp. 241-256).

The author explains the diagnosis, the history of the operation for tying the innominata, and the mode of performing the operation, with sufficient clearness. In every one of the four or five cases in which this operation has been done, death has followed on from the 26th to the 67th day. The procedure devised and first practiced by Mr. Wardrop has, on the contrary, been more successful in its results. It is a modification of Bransdor's operation, and consists in applying the ligature around one of the branches of the innominata, either the subclavian or the carotid, as may seem most expedient. Mr. Wardrop says (*Cyclop. Pract. Surgery*, vol. i. p. 237), "It is a fact demonstrated by dissection, and worthy of remark in contemplating this mode of

operating, that when a spontaneous cure of aneurism of the aorta has been going on, Nature has usually plugged up the carotid, so that in performing an operation for the cure of such an aneurism it would be advisable to imitate her in this respect, and to place the ligature on the carotid instead of the subclavian;" but if either of the two vessels were entirely or partially obstructed, the ligature should be applied around the other. Mr. Hancock, writing in 1839 in the *Cyclop. Anatomy and Physiology* (art. "Innominata"), concerning this operation, uses the following language: "Out of the seven cases in which it has hitherto been employed, and which I have here cited, three were successful, and of the other four one lived for a period of twenty months, and another for about two years after the operation." And yet, in the face of these facts, we find Mr. Miller, in his *Principles of Surgery*, p. 578, saying of it, "In my humble apprehension, under all circumstances inexpedient; because containing within itself the elements of *certain failure*." We are sorry to observe that the only mention which Mr. Skey makes of this method is, "in aneurism of the innominata, the operation of Brasdor has been successfully revived by Mr. Wardrop"—p. 210. We may mention, as supporting the propriety of this operation, and in confirmation of the statement of Mr. Wardrop, that in the "Catalogue of the Royal College of Surgeons," to which we have already referred (pp. 258-260), there are descriptions of five preparations of aneurism of the innominata; in two of these the right subclavian and carotid arteries are healthy; in one they are a little dilated; in a fourth, "between the first rib and the clavicle, the subclavian artery is obliterated, probably by the pressure of the aneurism;" and in the fifth "the right carotid artery adheres to the front of the sac, and is flattened by it; the right subclavian adheres to its lower part, and is obliterated by its pressure."

We had intended to quote in full the author's description of the operation for securing the subclavian artery, inasmuch as it differs in its line of incision from those usually practiced, and as the history of the case in which it was performed has never before been published. But we must content ourselves with simply referring to it, pp. 211-218. We pass over, also, what remains of this chapter, and several of those which succeed it, in which he treats of venesection, arteriotomy, and varicose veins, to that in which the subject of amputation is discussed.

To this class of operations Mr. Skey devotes seventy pages, considering first the circumstances which justify or require such a serious operation, the different modes of performing it, with their respective merits, and some other points pertaining to it; and, secondly, special amputations.

Like the other chapters, this one contains a great deal of very valuable advice. Mr. Skey is averse to amputating, whenever it can be avoided, and very properly contrasts the present improved state of surgery, as respects this operation, with its condition some years ago, limbs being preserved for years of usefulness now, which then were sacrificed as a matter of course. He truly says, "that the aim of surgery is to preserve, and not to destroy; and that more real superiority is exhibited in the successful application of skill that retains a limb, than in the dexterity, however great, with which it is severed from the rest of the body." And, in accordance with this principle, he endeavours honestly to lay down the proper grounds upon which alone an amputation may be done, and the best method of doing it. The chapter possesses numerous and decided merits, and the few faults which a critical eye may detect in it are generally rather of omission than of commission, resulting sometimes from haste or carelessness in composition. As an example of this, we may refer to his description of the mode of performing the circular

operation, p. 303, which is not clearly expressed. Mr. Skey enumerates as among the circumstances which justify or may require amputation, "extreme cases of irreducible dislocation;" but before this step is resorted to, he says that all other means must be tried for the purpose of relieving the difficulty, such as dividing the obstructing tendons, ligaments, &c. "If this principle be fully carried out, if the surgeon resolve to sacrifice the joint, or rather to risk the destruction of the joint as a movable articulation, amputation will be rarely resorted to in cases of irreducible dislocation"—p. 302. And on the same page he says, "With regard to operations for distortion, &c., or operations of expediency, as they are somewhat inappropriately called, I have only to remind the reader that they are so often followed by serious and even dangerous results, as are, indeed, all large operations performed during a condition of the nervous system unprepared for the shock, that they should rarely, if ever, be recommended, and not always resorted to on importunity." Here, it seems to us, Mr. Skey stoops too much from the firm and dignified stand which he before assumed with respect to operations not demanded by necessity. We do not think that a surgeon has any right, nay, we think that he would do wrong, to perform so serious an operation as this from any amount of *importunity* on the part of the patient, unless he were firmly convinced in his own honest heart of its propriety. We can scarcely conceive that any case of simple unreduced dislocation will justify an amputation; neither are we disposed to admit the propriety of this operation in the case of distortion or deformity, unless a state of actual disease shall have resulted from them. And always before removing a limb or a portion of a limb, the surgeon should satisfy himself that the dangers to life and health, with and from amputation, would be less than they would be without it. The patient cannot appreciate or estimate the dangers attending amputation, even of a small member, so well as the surgeon, and, therefore, the full responsibility of the performance of an operation cannot be transferred from the latter to the former; neither can the surgeon be forced to perform an operation of which he disapproves.

Mr. Skey has contrived a tourniquet which, we should think, will be found a very useful one in amputations, and whenever else it is necessary to arrest the circulation through the main artery of a limb without producing constriction around its entire circumference. The description and representation of this instrument will be found in another department of this Journal.

Chapter tenth is taken up with the operations of *excision* and *resection*, concerning which, the author's remarks are very judicious. Next follow in order chapters devoted to operations practiced on *tumours*; on *bursæ* and *ganglions*; those performed on the *head, face, and neck*, including the process of elevating depressed cranial bone, the rhinoplastic operations, those for polypus of the nose, hare-lip, ranula, enlarged tonsils, staphylocorophy, bronchocele, tracheotomy, and laryngotomy. These are well described and judiciously chosen.

The operations on the *chest and abdomen* constitute the next portions of the volume. Among these we find *paracentesis* and those for the different varieties of *hernia*.

The author's remarks concerning the last-named affection are thus commenced: "The operating theatre of a hospital is the only school for the acquisition of a complete and practical knowledge of hernia. Indispensable as may be the cultivation of anatomy to entitle a surgeon to rank in the operative department of our art; we find, perhaps, no branch of the subject in which the acquirement of the dissecting-room leaves the real necessities of the practical surgeon so unsatisfied as that of hernia, or in which the recollections

or associations of that theatre of study can so little be brought to bear upon the almost infinite varieties of form and structure that present themselves to the operator throughout a long career of hospital practice." Every one will admit the truth of these observations. But Mr. Skey has no intention, as he proceeds to say, to undervalue the importance to the operator of a dissecting-room education.

The subject of this chapter is very well handled; the author's views of the pathology and of the practice being very judicious. In treating of hernia, he examines its nature and the causes which produce it; the anatomical relations of the protrusion, the obstacles to its restoration, and the mode of overcoming these. He very properly asserts that "a hernia is always the cause of its own strangulation, unless the aperture through which it escapes from the abdomen consists of muscular fibres so arranged as to be able to contract around it." And this fact has an important bearing upon the treatment of strangulated hernia, and shows the folly of long postponing the resort to the knife, in favour of the continued employment of the hot-bath, tobacco cataplasms and enemata, bleeding, and the like remedies, as though the constriction at the neck of the sac depended upon muscular spasm.

In detailing the symptoms of strangulated hernia, the author points out some of the sources of doubt and error in forming a correct diagnosis. In all such cases, he recommends the operation, if other means fail, provided that, with the other symptoms of this affection, there be positive swelling, however small and difficult of detection it may be. "It would be better to cut down unnecessarily on ten tumours bearing the evidence of hernia, than to omit to bring one true hernial tumour to the test of the knife. For, it must be recollected, the operation suggested is not the operation for strangulated hernia, but merely an exploration preparatory, if necessary, to the operation itself. Such a case occurred to me, during the course of last summer, in St. Bartholomew's Hospital. A man was brought in, having symptoms of strangulation, with a tumour in the groin. My colleagues and myself were unanimous in our opinion of the existence of hernia. In the absence of Mr. Lawrence, who had, however, seen the case, and recommended the operation, the duty devolved on me. I exposed the tumour, which proved to be an absorbed (absorbent?) gland. This man had local pain, sickness, and constipation."

With reference to the delaying of the operation, he says: "I believe it may be asserted, without fear of contradiction, that the danger attendant on the operation for strangulated hernia is nearly in proportion to the period of the strangulation. Within the last quarter of a century, the treatment of that disease has undergone a considerable improvement, founded on an advanced pathology. Within my own recollection, many hours, even a day or more, were allowed to elapse, for the purpose of bringing into action many worthless remedies that were inoperative to any purpose but that of reducing the small chance of the patient's recovery, by wasting the precious hours during which the operation might have been undertaken with a prospect of success. The profession had a routine of remedies which were resorted to in a given order of succession; and, until they were exhausted, it was not deemed right to have recourse to the only remedy that could be available to a successful result. The taxis, warm-bath, taxis repeated, cold effusion, the local application of ice, taxis repeated, the tobacco enema, and, finally, more taxis, and then the operation." This is all very true; and we have no doubt that many lives have been let slip by the too prolonged and repeated application of manual efforts by the surgeon and his friends in consultation. We commend, therefore, this determination of Mr. Skey: "I have myself adopted a rule for many years,

not to attempt reduction by any persistent effort, after having ascertained that a previous attempt has been judiciously made by a *competent man*." The author ranks the application of *cold* to the tumour as next in efficacy to the *taxis*.

We need not comment upon his description of the performance of the operation in general. We think, however, that he makes an unnecessarily liberal allowance in stating that the division of about a *quarter of an inch* will generally suffice for the return of the protrusion; we are inclined to think that a much more restricted incision will *generally* relieve the stricture.

The quotations which we have made will, we hope, favourably impress our readers, as we have been impressed, with Mr. Skey's book, so far as it refers to hernia. In his observations on special hernia, the general principles on which we have thus far remarked are carried out.

We have next presented to our notice certain operations practiced on the external organs of generation in the male, on the male perineum, and about the anus. Of these we shall only notice those of *lithotomy* and *lithotrixy*, with which the 18th Chapter is taken up.

Mr. Skey's remarks concerning these procedures for relieving the bladder of the stone are conceived in a spirit of great candour and good judgment. Of the two, he prefers the crushing operation whenever it can be resorted to, considering this the rule, the other the exception; and his object is to lay down certain conditions which are favourable to, or demand, the one rather than the other. He says, "If we were to select a case for the exhibition of the operation of lithotrixy—and I take lithotrixy as the rule, and the cutting operation as the exception, considering the simpler and safer course that demanding the first consideration, and before the tribunal of which the case is to be first brought to trial—if we had the power of selecting a case especially suitable in all its bearings, we should require the following conditions: First, well-developed manhood; second, a healthy and readily dilatable urethra; third, a bladder free from irritation, and capable of retaining at least six ounces of urine, a condition which infers the absence of prostatic disease; fourth, a tonic condition of the nervous system; and, fifth, the presence of a stone of such dimensions as to be readily embraced by the screw of the lithotrite." These conditions become the subjects of further discussion and modifications, and directions are given for the preparation of the patient for the operation, which is all important, for upon judicious preparatory treatment we believe the success of the operation very much depends.

Mr. Skey is by no means singular in interdicting lithotrixy in children; but we think there is no real ground for the objection. His reasons are, the small size of the urethra and bladder in the child, and the danger that an instrument small enough to enter the bladder would not possess sufficient strength to permit of the crushing of the stone, but would rather break itself; he has no doubt, however, "but that the operation of lithotrixy may be rendered available to boys as early as thirteen years of age, by a reduction in the size of the adult lithotrite, and by careful dilatation of the urethra." But it must be remembered that the urethra of children is very dilatable, and that the calculi which are formed in the bladder at this age are generally smaller, and not more hard, than those which occur in the adult. And what theory will justify in this case, practice confirms, for the operation has been done often enough in children, even of very tender years, to establish its propriety. We have met with the following cases, after but a very brief search in a few of the journals: M. Segalas operated upon a child only thirty-three months old, and in six sittings, in as many weeks, crushed an oxalate of lime

calculus eleven lines in diameter; the child, during this time, was permitted to sport as usual, and his recovery was complete. (*Am. Journ.*, vol. xx. p. 234, and *Brit. and For. Med. Rev.*, vol. v. p. 250.) M. Guersent, Jr., cured five cases of eight in children, only one of the deaths being due to the operation; he cut thirty-seven children for stone, of whom seven died, four of them, however, not from the operation, but from intercurrent diseases. (*London Lancet*, vol. i. 1848, p. 184.) A reviewer in the *Brit. and For. Med.-Chir. Rev.* (vol. i. p. 120) says that he has "operated successfully upon two boys between two and three years of age; one between three and four; one but little more than four; one about seven, and a girl nine years old. In one of the two youngest the calculus was mulberry, and about the size of a bean; it was crushed in one sitting, and not a bad symptom followed. In the other, the calculus was phosphatic upon a base of lithic acid; it was about the size of an almond (with the shell), and ten sittings were required, but the cure was complete on the 30th day. In the case of the boy in his fourth year, the calculus was mulberry and scarcely so large as the last; three sittings were required on alternate days, and after the third, the cure was complete. In the next in point of age, the calculus was also mulberry, and about the same size; four sittings at different periods within twenty days completed the cure. In the boy aged nine, a calculus of lithate of ammonia, larger than a bean, was crushed in two sittings on alternate days. In the girl, a lithic acid and lithate of ammonia calculus, of the size of a large walnut, was complicated by a deranged state of the general health, hectic, and catarrh of the bladder, the symptoms of stone having been observed upwards of four years; yet in twenty-four days, after six sittings, the bladder was completely liberated; the only accident was the detention of two large fragments at the meatus, after the first sitting, and the child has since continued in good health." Dr. Nathan R. Smith, of Baltimore, "has performed lithotripsy, with Jacobson's and Heurtebout's instruments, on infants two years of age, in no less than four instances, and on several other very young subjects. In one respect he has found the operation more certain than on adults; the bladder expels the fragments more promptly." (*Trans. of the Am. Med. Assoc.*, vol. ii. p. 227.) Thus, it would seem that Mr. Skey is not at all borne out by facts in his condemnation of this operation on children. The real objection stated by those who have performed it on such patients is that the neck of the bladder dilating quite freely, and the stream of urine flowing through it strongly, fragments may enter and remain in the urethra, requiring, perhaps, another operation for their removal from this new situation; but in only one of the cases which we have quoted was this difficulty met with. Mr. Skey makes no allusion to the applicability of lithotripsy to females, and perhaps from the emphasis which he lays on "*well-developed manhood*," as one of the pre-requisite conditions for its performance, he may intend to confine it to the male sex. But the tables of M. Civiale rather go to show that its results in the female are even more favourable than in the male, in consequence of the anatomical and physiological peculiarities of the urethra in the former. And it is certain, that if any operation other than that of simple dilatation of the urethra and neck of the bladder be requisite to relieve the bladder of a woman of stone, lithotripsy possesses a great advantage in being free from the liability of leaving behind it such an annoying and mortifying infirmity as a *vesico-vaginal fistula*, which, we believe, is rather apt to remain after lithotomy in the female. Mr. Skey does not inform us whether he is an advocate for the use of chloroform in these operations, or not. This is a question of some importance, now that the administration of this "sweet oblivious antidote" has become so general.

We see no reason why it should not be given in *lithotomy* as freely as in any other operation; but we think there is a decided impropriety in employing it in *lithotripsy*. There is no operation which demands gentleness and delicacy of manipulation more than this. The only evidence which the operator can have, that he is doing injury to his patient, is the exhibition of suffering on the part of the latter; but this warning signal is rendered inoperative by the anæsthesia of the patient. In order to secure, so far as can be done, successful result after this operation, the physical and mental condition of the individual should be as healthy as possible, and the instincts which apprise him and the operator of the infliction of injury should not be silenced or unheeded.

For the cutting operation, Mr. Skey advises the use of a staff having a curve longer and more considerable than that which is in common use, and of a *scalpel* instead of the *gorget*. He differs from other surgeons of high and deserved repute, whose advice should not be hastily departed from, in inculcating that there is no danger in cutting through the bulb of the corpus spongiosum. The lateral operation is the only one which he describes.

Several lengthy chapters are taken up with the consideration of *lateral curvature*; *club-foot*, and other deformities; *puncture of the intestines in constipation*, and for *imperforate anus in infants*; *removal of cicatrices*, and *autoplastic operations*; *extraction of foreign bodies from the tissues*; *acupuncture*. And the author also devotes considerable space to the discussion of the *Cæsarean operation*, and *ovariotomy*, procedures which are now exciting much interest at home and abroad. The question of the greatest importance at present, concerning the latter, refers to the *diagnosis* of the morbid condition, and on this Mr. Skey sheds no light. He advocates the operation strongly—more strongly, it seems to us, than is advisable, considering the errors in diagnosis which are constantly being made, from the impossibility of being surely right, and in view also of the tendency, which he acknowledges to exist, to the performance of bold operations which are often not justifiable. If all who have practiced this procedure would publish fully the results of unsuccessful as well as of fortunate cases, and would make known their errors of diagnosis and the sources of them, as we believe has been done by the most distinguished of its performers in this city, the profession would soon be in a position to judge more fairly of its propriety and its merits. Until then it need not surprise us that the vast majority of judicious men look upon it with doubt and distrust.

The remaining sixty pages of the volume are devoted to operations on the eye. With these Mr. Skey acknowledges in the preface that he is less personally familiar than with the foregoing; and he has therefore "not hesitated to make an extended reference to the works and opinions of others" concerning them. Among other distinguished ophthalmologists whom he quotes, we see the names of Scarpa, Mackenzie, Lawrence, Dalrymple, Weller, Jürg, &c.

In conclusion, Mr. Skey has appended an "index to instruments and apparatus required for special operations," which, we have no doubt, will be of assistance to young operators.

The wood-cuts illustrating the text of this volume are very numerous and descriptive. The style in which the author clothes his thoughts is deficient in elegance, often it is even very faulty, and sometimes exceedingly obscure; like the utterings of Delphos or Dodona, it is frequently susceptible of more than one interpretation.

No one, at the present day, when so many zealous labourers are in the field, if he rely solely or chiefly upon his own abilities and acquirements, however

great these may be, can make a book on any subject connected with medicine, which shall be as complete as it might have been had its author sought for, and availed himself of the harvest of his fellow-reapers. And, therefore, this volume of Mr. Skey's cannot be considered so much an exposition of the present state and requirements of operative surgery, as of the opinions and practice of a surgeon who thinks for himself, and who has had abundant opportunity of gaining practical skill and knowledge. Amongst other merits this must be looked upon as an important one—that its advice is decided upon everything, and its recommendations are explicit; its reader is not left in doubt as to what the author would counsel him to do. F. W. S.

ART. XIII.—*Le Climat de l'Italie, sous le rapport Hygènique et Médicale.*
Par le Docteur ED. CARRIERE. Paris, 1849: pp. 582.

The Climate of Italy in its Hygienic and Medical Relations. By Dr. ED. CARRIERE.

IMPRESSED with the favourable position Italy occupies on the globe—its geographical situation, its mild and soft climate, and the vast extent of its accessible coast—Vitruvius, centuries ago, remarked that this favoured land had been so placed, in order that it might conquer southerners through the effect of physical force, and subject northern nations through the influence of the intellect. In an historical point of view, as our author observes, the remark is correct, for it expresses the double influence which the Roman world exercised on contemporaneous nations. But it does more, extended as it may be to mean, that the race by which that country was peopled was, like its climate, of a mixed character, and that, while the ancient masters of Italy were endowed with the power which conquers, and the thought which civilizes, the climate and the soil of their country combined the tonic effects of the north with the enervating influences of the south. The opinion of Vitruvius was that of all antiquity.

"The happy soil of Italy, which had to fear neither the extreme cold of Germany, nor the scorching rays of the Egyptian sun, was, of all others, the soil of predilection. None other, either on the Grecian coast or in western regions, was preferable. Such advantages, which, doubtless, were exaggerated at the time that Rome was at the pinnacle of splendour, attracted the barbarians to the soil of the peninsula. All the luxuries—all the monuments—all the power of the metropolis and of Italy disappeared before them; but the climate remained. It has become in our days a subject of investigation, and medicine has been enabled to class it among the active means employed to combat disease."

The science of climatology is far from being one of recent creation. It ascends to a remote period in the history of medicine, and, like most other branches of professional inquiry, originated in Greece. But, though at that early period some of the many effects of climate had been noted, the therapeutic and hygienic deductions to which they led were overlooked. Nor does it appear that by the Romans much progress was made in the science; for, though Ideler* has, with true Germanic industry, pointed in ancient records to indications, more or less satisfactory, of investigations relative to the

* *Meteorologia Veterum Græcorum atque Romanorum*, 1832.

therapeutic properties of climates, the results obtained are scarcely of sufficient value to deserve the attention of medical inquirers. It is true that the Romans did not fail to note the peculiarities of the Italian climate. So far from it, physicians, poets, historians, in works we still read with pleasure and advantage—Pliny, Cato, Varro, Cicero, Palladius, and Columella—have, while treating of the cultivation and natural history of the soil, entered into useful details relative to the general conditions of the atmosphere, and the varied characters of the seasons. But beyond these meteorological questions they did not proceed, unless, indeed, to sing the praises of their country; and the medical inquirer finds in their writings nothing which can be applied to useful professional purposes.

It does not appear, indeed, that anything of interest or value was effected on the subject prior to the return of the crusaders from the Holy Land, when the professional services of the pupils of the schools of Monte Casino, but especially of Salerno, were extended to the wounded and sick, who, many of them individuals of rank and note, remained a greater or less time in the country, or even took up their abode permanently there; and, appreciating the advantages and delights of the climate, probably led the way to the correct investigation of its hygienic and therapeutical influences. This at least we may infer from the fact that the only work which the Italian school of that period produced, or rather which has come down to us, the poetic treatise on Hygiene of Salerno, *Regimen Medicinæ Salernitanæ*—in which the action on the human body of external agencies is clearly pointed out—we find nothing relative to the therapeutical influences of the climate of that place, or of the peninsula generally. The revolutions, civil wars, and foreign invasions, of which Italy was long the victim, greatly retarded the progress of professional investigations on this and other subjects. But at the period of the revival of sciences, the study of epidemics, which had, long before, exercised the minds of Grecian physicians, elicited the attention of the Italians. Our author remarks, indeed, that the subject could scarcely fail to attract particular attention in Italy, inasmuch as the peninsula had been, even during the time of the Romans, a prey to those terrible scourges which extend their ravages over entire populations; and as, since it had become covered over with ruins, those disasters had returned at short intervals, and appeared to derive an increased energy from the insalubrious conditions of some portions of the soil. Physicians applied themselves in consequence to the analysis of the effects, as well as to the study of the causes, of those diseases; and their investigations, which were the results of necessity, led to more precise notions than were before possessed relative to the condition of the soil, the quality of the air, the influence of the winds, and the relation existing between these agencies, and the physiological and pathological effects they produce on the human body. Many of the works written or published on this useful and interesting topic have, doubtless, been lost; for we possess none anterior to the two memoirs of Lancisi on the Roman climate, and which appeared, or were written, about the close of the seventeenth, or beginning of the eighteenth century. Those that have followed usually refer to particular towns or circumscribed territories, and even of such, very few deserve serious attention, being, for the most part, written with a view to extol, in the most eulogistic style, the beauties, excellencies, and curative effects of particular places, and to prove their superiority over every other spot in creation. Dr. C. properly excludes from this censure a few works of decided merit, which have appeared in our own days, and are written with what he denominates scientific sincerity. Among these may be mentioned the works of De Renzi and Roubaudi; to

the former of whom we are indebted for an excellent monograph on the medical topography and statistics of Naples, and to the latter for a very good essay on Nice and its environs. Of the productions of those who treat of the climate of the whole peninsula, Dr. C. does not speak favourably. Dr. Clark (Sir James), he says, has contented himself with combining figures, more or less accurate, with monographs, which are almost invariably unsatisfactory. Dr. Barzelotti, of Pisa, has, at least, produced something original, by drawing up a chart divided into categories of climate, in which each of them is represented by a particular colour. But the work is merely ingenious. As to the text, the poetic element figures in it conspicuously, and besides, it consists of little more than a kind of guide book, useful to every one but invalids. To those who are acquainted with these two works, we scarcely need remark that, though defective in some respects, they, especially the first, are entitled to greater regard than our author seems willing to accord to them. But, while entertaining this opinion, we are free to admit that he has not been too severe on the work of his countryman Thouvenelle, which appeared at the close of the last century. It is now before us, and, after examining its contents attentively, with the view to the preparation of this article, and in order to compare the results of the observations therein embodied with those to which Dr. C. has arrived, we have, like the latter, found it to contain nothing we searched for—the author entering into no useful details, and offering few practical applications. He places the scene of his investigations far above the surface of the earth, and in the regions of the clouds, where every agency devolves on the gaseous fluids, and on the electricity floating in the atmosphere.

Dr. C. first treats of the climate of the Italian peninsula generally, and in a separate division of his work passes in review the climate of separate places. For the latter purpose he divides the whole country into three regions—the southern, the middle, and the northern. The first of these regions comprehends the country south of a line drawn from the eastern shore of the Gulf of Gaëta, on the Mediterranean, to the Adriatic Sea, by the valley and mouth of the river Pescara. It includes all the Neapolitan provinces, (Salernum, Capri, Massa, Torrente, Castellamare, Torre del Greco, Resina, Portici, Naples, Puozzoli, Baia, Ischia, Gaëta,) with the exception of the ulterior Abbruzzi. The middle region is comprised between the ulterior Abbruzzi and the Bolognese territory on the Adriatic, and between the Gulf of Gaëta and the territory of Lucca on the Tyrrhenean Sea. It is composed of the Roman States and Etruria, Rome, Sienna, Florence, Pisa, and the Roman and Tuscan Maremma. The northern region is that which forms part of the continent, and from which the Peninsula starts. It comprises, among other places of interest, Venice, Milan and its lakes, Genoa, Menton, Villefranche, Nice, and Hyeres.

In investigating the climate of the country in its *ensemble*, as well as the climate of separate localities and cities, our author has adopted the division proposed by Hippocrates; convinced as he is, and as every writer has been, who since the days of the Coan sage has turned his attention to the subject, that, whatever may have been the progress of the science during that long period, the investigator finds it necessary to resort to that inevitable trilogia, air, waters, and situations. But, while we admit this necessity, we cannot shut our eyes to the fact that it has lost a portion of its original simplicity. Each of its elements forms, at present, a fasciculus or combination of numerous facts or circumstances, which require a degree of development proportionate to their relative importance. Thus *situations* comprehend the

form of the territory, its exposition, its geological composition, the chemical transformations it may present, the general characters of the vegetation—those indices of the quality of the soil, and of the influence of the sky. The waters, which must be studied not only in reference to their nature, but also to their distribution around continents, and on the surface of the soil itself, must be examined, likewise, under that meteoric form which condenses, after having reduced them to the state of vapour, and plays so active a part in the conditions of the climate, and the diurnal changes it undergoes. The air comprehends the entire history of the movements of the atmosphere and of the reactions which it undergoes through the instrumentality of electricity, caloric, gaseous substances, and of those undetected agencies which float in the midst of this luminous ocean. By adding to these several orders of causes, man, or the race they modify, or that exhibits more or less deep imprints of their power, but at the same time modifies them to a greater or less extent, the principal conditions of the problem will be grouped in the mutuality and combination of their relations.

Italy has been compared, so far as regards the configuration of its territory, to a boot, the toe of which pushes Sicily out at sea. The comparison is not inappropriate; but Dr. C. very justly prefers the one suggested by Pliny, who remarked that that country resembles a long and narrow oak leaf, the indented edges of which give a good idea of the long series of bays, gulfs, and promontories by which the coast throughout its whole extent is studded; while the rib which divides the leaf longitudinally represents the important Apennine chain which divides, in a corresponding direction, the maritime region of the country. The Apennine in this way separates the peninsula into two opposite zones; the one facing the Adriatic, the other the Mediterranean. In its course it sometimes approaches to, at other times it recedes from the coast, and sends off several lateral prolongations, as the Campanian chain, or the mountains of Gaeta; and on reaching the southern extremity of the kingdom of Naples, bifurcates, and proceeds east and west. But in a northern direction the Apennine does not ascend as far as the farthest limits of Italy—belonging only to the maritime or peninsular portion of the country; whilst the Alps constitute, in some measure, the basis of the continental portion. These important mountains constitute the northern barrier of the Milanese, and between them and the Apennine chain (which proceeds from the margin of the Gulf of Genoa to the centre of Italy, whence it takes a southern direction), are situated, not only the latter territory, but a large portion of the Papal domains. This well-watered, populous, and fertile region is enclosed on all sides, except the eastern, or that facing the Adriatic. The northern portion of Tuscany constitutes the limits of continental and the commencement of maritime Italy.

The western and eastern zones or regions, formed in the way mentioned by the Apennine chain, and extending on both sides from the mountain to the sea, differ from each other in a very important point—namely, as regards their level. The first or western zone consists, in many places, of a low plain on which the water flows with difficulty, and which favours the overflow of the sea or of the running streams. The eastern region, on the contrary, assumes the character of an amphitheatre, and the coast, instead of being flat and level, is high above the surface of the sea. It is scarcely necessary to remark that this difference in the topography of the country is one of great importance in a hygienic point of view, occasioning, as it must naturally do, a very great contrast in the salubrity of the several localities. Marshy overflows are formed on the low flat and level portions of the soil; and from these, under the influence of high atmospheric heat and other agencies, arise those miasmatic

exhalations which produce remittent and intermittent fevers. The western region of maritime Italy presents many such marshy districts; while the eastern, as also the coast of the Ionian Sea, though not free from them, is much less characterized by them than the former.

Dr. C. very justly remarks that, if the depressions of the Italian coast occasion inconveniences, its multiplied irregularities and deep indentations give rise to important advantages. Maritime climates enjoy more agreeable influences than those of continental regions. These agreeable influences, which are connected with the hygrometrical condition of the atmosphere and the uniform temperature of the sea, are in ratio to the sinuosities of the coast, or in other words to their absolute development. In proportion as the coast exhibits that character, do the extremes of temperature approximate to each other—the less cold there is in winter, the less heat there is in summer.

"Europe," he says, "is, of all countries in the world, the most favoured in this respect; and in Europe there are two regions, which on that point may be placed above all others. The one, England, with its depending islands; the other Italy, from Tuscany to Calabria. The former is indebted to those conditions for an hibernal mean, which, even at the 62d degree of latitude—that of the Feroe Islands—has never descended lower than zero (Cent.); while the other owes, in a great measure at least, to the same influences, the high degree of its mean winter temperature."

Important as doubtless are the circumstances already mentioned towards constituting a favourable climate, others are scarcely less so. With a suitable latitude, a proper exposition, a right direction of mountain ranges, combined with proximity of the sea, we may have a mild climate; but the latter will not necessarily prove healthy. Nor does the salubrity of a country depend exclusively on the elevation of the soil above the surface of the water surrounding the territory, or flowing on its surface. Much is due to the nature of the mineral strata constituting the soil. So far as regards Italy, this question, whether considered in a geological or a chemical point of view, is deserving of special attention; for we have already seen that on the surface of her soil there exist numerous sources of miasmatic exhalations, which spread their baneful influences far and wide. Impressed with the importance of the subject, Dr. C. enters into many details which our limits compel us to omit. It will be sufficient to remark that, on the higher points of the Alps and Apennine, we find the granite. On the slopes, and sometimes far into the interior of the land, calcareous rocks of secondary formation predominate. They are very compact; are characterized by a fine and close grain; and resist, during a long series of years, the action of decomposing agencies. They are found as far as the limit formed by the line of Bergamo, Brescia, and Verona in northern Milanese; as also in localities of great salubrity, such as the Gulf of Gaëta, the coast of Amalfi, and from Policastro to the borders of the Ionian Sea. The plain of the Milanese rests upon a thick chalky stratum, which extends along the western and eastern edges of the Apennine, as far south as the frontiers of the Neapolitan States. It is covered over with a more or less powerful diluvium, and with deposits of comparatively recent date, the materials of which furnish aliment to the magnificent vegetation of this portion of the Italian soil. From Turin to the farthest confines of the Calabrias, the hills and various accidents of the territory skirting on each side the great peninsular chain, present a soil of marine and paludal origin, which has received the name of sub-Apennine. Its aggregates have but little solidity, are very porous, and possess great affinity for water, with which it is easily and frequently saturated; a condition which, when not carried beyond certain limits, is favour-

able to vegetation; but, when aided by high atmospheric heat, may prove detrimental to health. To these various species of soil must be added others which may be denominated accidental, and exercise a great influence on the character of the climate—i. e. the volcanic. In Italy, they are extensively distributed, and found not only in the territory of Naples, and one of the islands of the Gulf, where, to say nothing of Vesuvius, they retain a certain degree of activity, but also in the Campagna di Roma, and even about the city of Rome itself.

In the Papal States, this volcanic soil extends from Aquapendente to Nettuno, situated on the maritime and northern edge of the Pontine Marshes. After Terracina, at the southern limits of those marshes, as also on the secondary mountains of Gaëta, the volcanic soil reappears constituting the Phlegrean fields. The volcanic products of the Roman States consist, in great measure, of tufas and porous substances easy of decomposition. Those of the Phlegrean fields are more various in their structure—consisting of the different varieties of lavas, some of which undergo decomposition in a comparatively short space of time; of tufas and scorix which soon lose their physical characters; sulphurous products of various kinds, &c.

"What," as Dr. C. asks, "are the effects of those sulphurous emanations on the healthy conditions of the air? Do they render this fluid more exciting, more electrical, or less salubrious? These are questions of too much importance not to be taken up at a future period. At present, it is sufficient to state that the structure of volcanic soils favours more readily the process of decomposition than that of less compact soils which have been formed during the course of the regular periods of geological ages."—p. 19.

Dr. C., in continuation of this subject, next notices the changes that have taken place in the dimensions of certain portions of the Italian coast, by the receding of the sea and the consequent extension of the land. Of this phenomenon, that part of the Roman coast where are situated the mouth of the Tiber and the city of Ostia, affords a fit illustration. For here, the coast has received and continues to receive such extensive additions, that there exists now a maritime margin or surface of about four miles in extent between its former and present limits.

"This partial revolution has not resulted merely in pushing back far inland the old city, formerly the seaport of Rome, and in separating from the sea the ancient mouth of the Tiber. It has placed the city in the centre of an insalubrious territory of which it formerly occupied only the edge, and has been the cause of its progressive depopulation. We know that formerly Ostia was too small for the number of its inhabitants, and figured among the magnificent cities of Latium. At present, it contains only a priest, a tavern-keeper, four or five soldiers, and a few families, which do not venture even to reside in it all the year round. But this insalubrity is not limited to the city, for inasmuch as the miasmatic elaboration is conducted on a large scale, in consequence of the increased extent of the surface, there has arisen, since the time of the Romans, a new source of morbid effluvia, which must be taken into account when we inquire into the sanitary conditions of the country, though more especially when the wind blows from the sea. Lancisi has traced the comparative limits of this progressive extension of the coast, which in his time was already considerable, and we may, from that, form an idea of the enlargement of the Roman desert. The revolution which has displaced the coast of Ostia has operated, though less powerfully, on other points of the peninsula, and principally on the coast of the Mediterranean. They constitute so many additional sources of insalubrity, which circumstances, depending on human industry, have unfortunately only tended to increase, or at least to perpetuate. These elements must be united to those furnished by the inland regions of the territory, and, like them, be

taken into account in the analysis of the partial influences, as well as of the general characters, of the climate."

We cannot here follow our author into the developments he indulges, in relation to the extent and mode of cultivation, as well as to the products of the soil, of the several regions of the Italian peninsula, the changes they have undergone since the Roman period, and other subjects of kindred nature. All we can do is to call attention, very summarily, to one on which he dwells in detail—the almost entire removal, destruction, or degradation of the forest trees of many parts of the country. That in some respect the result has proved injurious, there can be but little doubt; but in many others, it must have been salutary, by removing sources of terrestrial and atmospheric humidity, and modifying and equalizing the temperature. Thus it is found, that snow no longer dwells long on the cold summits of the Soracte, as was the case in the days of Horace. The Tiber is no longer covered with ice, as described by Juvenal; and Pliny could not now complain of the rigorous cold, which destroyed the myrtles in his gardens at Laurentinum.

Of all the countries of Europe, the Italian peninsula is that in which water is found in the greatest abundance, whether in the form of seas, surrounding its extensive coast, or of rivers irrigating its surface, of lakes, of stagnant marshes, &c. Water, indeed, constitutes one of the most essential conditions of its climate. Of the extent of the general influence exercised by the waters of the sea on a surface, the width of which from the Mediterranean to the Adriatic is not considerable, some idea may be formed when we take into consideration the amount of coast which the peninsula presents; and which, commencing at Nice on one side, terminates at the Venetian territory on the other. Supposing the coast to be smooth and free from indentations, the line of shore washed by the two seas would amount to no less than six hundred leagues. But as these indentations or accidents are numerous and of great depth—more so, indeed, than in any other European country, England excepted—the amount of coast greatly exceeds those limits. In Europe generally, the difference has been inferred by Mr. Nagel to be as 1 to 3.03. In Italy, it is considered to be much more extensive, or as 1 to 5, furnishing, therefore, a surface of coast of not less than 3000 leagues. With these facts before us, we cannot but perceive the extent of the influence which the sea must exercise on the country—an influence which, from the deep indentations of the coast, is not restricted to the edge of the latter, but penetrates, in many places, far inland.

This liquid surface, as may easily be perceived, is an extensive source of evaporation, and affords us a ready explanation of the abundant nocturnal dews, and of the frequent clouds observed in those regions. Scarcely less influential in the production of these effects is the evaporation from the water, running and stagnant, situated on the surface of the country. In that part of Northern Italy which is enclosed on three sides by the high ridges of the Alps and the Apennine, comprising Piedmont, the Duchies, a part of the Papal States, and the Lombardo-Venetian kingdom, rivers, large and small, as well as other streams, exist in large numbers, and on a large scale, and form, on that vast surface, by their serpentine course, by crossing many lakes, and feeding the numerous canals made for purposes of irrigation and inland communication, a close net-work containing an immense amount of water. Dr. C. remarks that, laying aside the Po, whose extent is an object of wonder and admiration to him, as to all Europeans unacquainted with our American rivers; laying aside, also, those immense lakes, the *Laggo Maggiore*, the *Laggo di Como*, and the *Laggo di Guardia*, which he compares to inland

seas, we find that the canals of the Milanese alone irrigate, in the fine season, a surface of not less than 168,900 hectares, or about 422,250 acres. From this immense and well-distributed liquid surface, great benefits to agriculture and commerce undoubtedly result; but it is not less evident that it must, at the same time, from the vast amount of evaporation accruing from it, exercise an injurious effect on the state of the atmosphere and the condition of the climate.

The more southern section of Italy—which Dr. C. denominates maritime—though less, is still amply provided with running streams, besides being, from its narrowness, more under the influence of the evaporation arising from the seas by which it is surrounded. Add to all this, the extensive evaporation, most of which is of an impure character, arising from the rice plantations of the Lombardo-Venetian kingdom, the Venetian lagunes, the *battures* of the Po, the marshes of Aquileia, the great lakes of upper Italy, the marsh surfaces extending from Baia and Puzzoli to Gaëta, the Pontine marshes, the *maremme* of the Etruscan coast, the less numerous, though still extensive marshes found on the Adriatic side, as far as the territory of Otranto, those situated along the coast of the Ionian Sea, as well as from the numerous lakes, scattered in various directions, as Bolsena, Bracciano, Trazimene, Fusine, Peroli, &c., and we shall at once perceive that the importance attached to the vastness of the evaporation in question has not been exaggerated. The modifying and injurious effects which under any circumstances could not fail to arise from this cause, will readily be understood to be greatly enhanced, if we take into consideration that much of this evaporation occurs from localities where the water is stagnant, and contributes to the formation of pestiferous exhalations.

We talk often, and foreigners talk still more, of the paludal or marshy and insalubrious condition of a large portion of our country; but, if we turn our attention to Italy, we shall find that, making allowance for the diminutive extent of the country compared to ours, it is, as a whole, far richer in such sources of exhalation, and that the inhabitants, while luxuriating in the mellowness of their atmosphere, and admiring the beauty of their sky, may rest assured that they are breathing an air, and exposed to other external agencies, far more injurious than those encountered on this side of the Atlantic. Be this, however, as it may, from the immense evaporating surface existing in the whole peninsula, as well as from the peculiar configuration of the country, we are prepared for the fact that the quantity of rain that falls is considerable. This is shown by the following schedule which Dr. C. borrows from Gasparin's *Météorologie Agricole* :—

Winter. in m.	1. Southern or Maritime Region.				Whole year.
	Spring.	Summer.	Autumn.		
195.2 (7.8 inches)	194.2 (7.8)	133.2 (5.3)	291.7 (11.7)	804.3	(32.2)
	2. Northern or Continental Region.				
139.2 (5.6)	253.1 (10.1)	275.6 (11.3)	353.8 (14.1)	1021.7	(40.9)

From the results grouped together in this schedule, we perceive that the quantity of rain which falls in continental Italy is much larger than that obtained in the southern region of that country. This fact, which, from the circumstances of this region being pressed on each side by an extensive sea, might appear extraordinary, did we not know that the Lombardo-Venetian kingdom is covered with numerous rivers, lakes, canals, and agricultural marshes, and presents, therefore, an extensive surface to the action of evapo-

rating agencies. Nor must we fail to bear in mind that the country is enclosed by high mountains on three sides, and offers, from its configuration, an obstacle to the mobility or free movement of clouds; while in Southern Italy, on the contrary, the open surface existing on each side of the Apennine, allows an uninterrupted passage to the clouds in the higher regions of the atmosphere. We perceive also, from the same statement, that in the whole of Italy more rain falls during autumn than during either of the other seasons, the latter months of the year being the true and almost only period of very heavy rains, and, as a consequence, of those terrible overflows which return at short intervals and occasion so much injury in various parts of the country. We find, moreover, that the quantity of rain is not distributed in the same manner in the northern as in the southern regions of Italy. In the former, the quantity which falls in winter and autumn scarcely exceeds that obtained in spring and summer. In the other, on the contrary, the amount in winter and autumn exceeds that in the other two seasons by nearly 6.5 inches (160 m. m.). When we add to this the diluvian character of those rains, by which an immense quantity of water, sometimes that of a whole winter, is accumulated on the earth in the short space of a few days or weeks, it is evident that the nebulous or cloudy condition of the atmosphere cannot be of long continuance, and that to humidity must succeed a comparative state of dryness, which continues without interruption for some time. This explains the serene beauty of the winter and autumnal seasons in several parts of the peninsula.

In the northern region, beyond the Apennine, matters assume a somewhat different character. During the winter months, comparatively little rain falls, but during the three other seasons the quantity is abundant, and is distributed in each season, and almost in each separate month, with tolerable equality. From this regularity it may easily be inferred that the rain cannot fall in very heavy showers, for besides that these manifest themselves in one season only, they are prevented by a variety of influences from occurring often in the course of the whole year. Hence these heavy showers are of rare occurrence, and often altogether absent, the rains being of a light character, often repeated, and sometimes of long continuance. This hygrometric condition produces naturally a cloudy state of the atmosphere, which, without excluding periods of dryness, and a certain purity of the air, renders them somewhat unfrequent compared with what occurs in the southern region of the country.

Need it be remarked that this humid condition of the atmosphere, the enfeebling and depressing effects of which are well known, exercises a decided influence over the physical and moral character of the inhabitants of those regions of Italy where it predominates.

"The Lombard does not possess the coloration of the Italian of the southern region. Though he has not degenerated completely from the men of iron to whom he traces his origin, his face betrays a certain degree of paleness, which is particularly remarked in women, among whom the power of physical resistance is more feebly developed. When this effect is not corrected by some suitable agency—ventilation, for example—it shows itself in a marked degree, and attains a morbid form in deep valleys surrounded with woods, and containing lakes."

"When we enter the regions of those autumnal rains which seem to deprive the sky of humidity and clouds for the rest of the year, we remark, with a different elevation, signs of a greater activity, produced, doubtless, in part, by the temperature, but arising, also, from the circumstance that the humidity exercises there a less prolonged influence on man than in the north."

Dr. C. properly remarks that this rule is not absolute, and that in many instances a variety of circumstances are found to conceal, or even destroy, the effect. But in some localities it manifests itself in a very marked degree, as, for example, at Sorrento, in the Gulf of Naples. In Tuscany, which serves as a place of transition between Southern and Northern Italy, there is a city placed at the outlet of the last valley of the Arno, and not far from the shores of the Mediterranean, where rain falls frequently and the atmosphere is often cloudy—Pisa. Here the population presents the characteristics assigned above to individuals exposed to the almost continued influence of a humid atmosphere.

Our author next notices the brilliancy of the sky of Southern Italy, a brilliancy which strikes with astonishment individuals arriving from the north of Europe, or even of France, and consists in a vivid and luminous azure, very similar to that characterizing the equatorial sky. It is observed in all parts of that region, from the upper limits of the kingdom of Naples to the Ionian Gulf. From the entrance of the Gulf of Gaëta, where it commences abruptly, the landscape appears more brilliant, clear, and very neatly and accurately defined, thereby indicating the absence in the atmosphere of any notable quantity of aqueous vapour. In Central Italy the azure is much less vivid, and the atmosphere presents a vagueness and indecision in the landscape which denote a higher degree of humidity than in the Neapolitan States. At the period of sunset, and during the twilight, the vapours are condensed, expand, and assume the most variegated and gorgeous hues. But this spectacle, though often magnificent, and presenting a mellowness characteristic of the harmonious sky of Latium, is far from possessing the dazzling brilliancy of the sunsets on the coast of Calabria and in the Gulf of Naples. When we ascend in a northern direction, and proceed beyond the mountains of Etruria, the sky is found to assume a different appearance. It is far from possessing the brilliancy of the sky of Naples, and the refined tone characteristic of that of Central Italy. The azure is feeble, and presents a milky hue similar to that observed in northern regions. As there, also, the clouds are condensed in rounded masses of unequal size, whitish, and fringed at the edges, and dark in the centre; while the light stultifications of the Roman sky are as seldom observed as the vivid azure of the southern region, except, perhaps, it be on the coast of the Adriatic.

Much has been said in antiquity and in modern times of the winds of Italy. It is a subject of considerable importance in a climatological point of view, and well deserves the attention which has been paid to it from the days of Pliny to our own. But we have only room for a few remarks upon it. The atmosphere, during spring, is calm, and the winds proceed from the west. The easterly currents, which are warmer, succeed to the former in proportion as the summer season advances. To these follow the southern winds which spread heat over the Italian soil. Towards the eighth of July the Etesian winds begin to manifest themselves. Emanating from northern regions, and being regular in their return, they disperse the clouds, keep up the serenity of the sky, and exercise a dry and tonic influence very different from the enervating effects resulting from the action of southerly winds. About the close of the hot season the wind again blows from the south or the collateral points, and the atmosphere becomes heavy and oppressive. Autumn is characterized by the northwest wind—the most impetuous of all those that prevail along the Italian coast. Finally, the wind, in winter, blows from the north.

“This wind must not, however, be confounded,” as Dr. C. remarks, “with

the Etesian, for if the latter is directly opposed to the south wind, the other has for its antagonist the southwest. This hibernal wind is therefore the north-east, or, more properly speaking, the north-northeast, which by the Greeks was denominated Boreal, and by the Romans Equilon."

This enumeration and distribution of the Italian winds, which is little more than those recorded by Pliny (lib. ii.), apply particularly to the Mediterranean coast. Thus, on that side of Italy, the spring winds which impart warmth to the atmosphere, whose temperature had been lowered during the winter season, encounter no obstacle.

"They pass over the sea, which is warmer than the earth, and spread over the surface of the coast, to which they impart an agreeable degree of heat. But they cannot reach the Adriatic zone of the country without passing over the Apennine, and becoming cooled by contact with the snow which covers the top of those high mountains. The spring wind of the Adriatic coast is hence the east, and not the west wind, for the latter must be arrested on the side of that high ridge which divides the peninsula into two parallel zones. For the same reason, the east wind is more readily felt on the Mediterranean shore; since it must, like the former, pass over the Apennine. We have seen that during the summer season the prevailing winds were the south and Etesian. The latter, which proceed from the north, have a free access on both sides of the territory, and are equally felt on the Adriatic and the Tyrrhenian coasts. Not so, however, with regard to the equatorial winds. In consequence of the inclination of the western coast, which leans from northwest to south, the west, southwest, and south winds reach the coast in a direct manner; while on the other side, which presents a contrary exposition, the southwest and south winds penetrate with difficulty, the passage being free only for the southeast and east winds, and those occupying an intermediate position between the latter and the north winds."

The statements made in respect to the southerly winds apply to the north-west—the *mistral* of Provence, the *sciron* of Athens, and the *circius* or *cers* of some parts of the south of France. Like the west and south winds, the latter, which takes its origin or assumes the peculiar character it afterwards exhibits, to a greater or less extent, in the south of France, passes freely along the Mediterranean coast of Italy; but on the other side of the Apennine, where the topographical condition of the country is diametrically opposed, its influence is but slightly felt.

As may be inferred from what precedes, the north and northwest are the coldest winds of Italy, and, though sometimes attended with hail, they usually accompany clear weather. The north-northeast is mostly attended by a grayish and snowy hue of the sky, which generally ends with a fall of snow. The damp winds are the south and southwest—the *auster* and *Africus* of the ancients. The driest is the northwest; the hottest the south; the mildest and mellowest the southeast and west; finally, that most conducive to health is the north-northeast. The most enervating is the southeast, or *sirocco*, which prostrates the moral and physical energies of the inhabitants. This deleterious influence which is felt to a certain extent in the south of France, from the Pyrenees to the mouth of the Rhone, attains the greatest intensity in Italy, and especially in that part of it facing the Ionian Sea and the Grecian Archipelago. It is, like other southerly winds, charged with humidity.

"Its action on the human organization during the summer season," says Dr. Salvagnoli, "cannot be exactly expressed by words. When it prevails, persons in good health feel prostrated, their muscular movements are sluggish, the head is heavy and painful, they feel sleepy, and their appetite decreases. Convalescents easily relapse, and the sick become worse."

The south wind (*mezzogiorno* of the modern Italians) presents great analogy to the *sirocco*, especially during the hot and oppressive days of autumn. Nevertheless, imbibing, as it does, less humidity in winter, it disperses the clouds that arise from northern agencies, and contributes thereby to the production of clear and fine weather. This takes place sometimes in summer, but is necessarily more frequently observed in winter, from the excessive aqueous saturation existing in the former season, and the feeble degree of it occurring in the latter. The southwest wind, which, from the place of its origin, was anciently denominated *Africus*, and is called by the modern Italians *libeccio*, bears, in many points, a great analogy to the preceding. It is damp and rainy, but differs from the *sirocco*, which, though sometimes strong, is seldom violent, and from the *mezzogiorno*, which is usually calm, in this that it scarcely ever prevails without agitating the atmosphere tempestuously. The west wind, the zephyr of the ancients, and the *ponente* of the Italians, is warm in spring and cool in summer. The east wind, the *subsolanus*, or *Levante*, is milder, but less serene. The north wind, or *tramontana*, is characterized by a low temperature, and great dryness, produced by its passing over an extensive continental surface. It disperses the clouds, and is an attendant on fine weather, though in winter it is accompanied with snow, and in summer with hail. It exercises a fortifying agency on the human system, and must be considered as the best antidote against the enervating effects of the *sirocco*. The north-northeast is very violent, and blows frequently over the peninsula. It is often attended with a dry, though sometimes with a humid, condition of the atmosphere.

We pass now to the temperature of Italy. The country, considered in its *ensemble*, presents most, though not all, of those causes which Humboldt has enumerated as favouring the development of a high annual average of atmospherical heat: *i.e.*, proximity to a western coast in the temperate zone—the configuration of a continent presenting peninsulas and inland seas—the relations of position of a part of that continent either to a sea free from ice, and extending beyond the polar circle, or to a considerable extent of continental surface placed between the same meridians, under the equator, or in some part of the tropical zone—the preponderance of southerly or westerly winds, at the western extremity of a continent of the temperate zone—chains of mountains serving as means of shelter against the action of winds proceeding from colder regions—the absence of marshes, and the clearing of an arid and sandy soil—the habitual serenity of the sky during the summer, and the proximity of some southern stream rolling waters of a higher temperature than that of the surrounding seas. At the same time the country, doubtless, presents some of the conditions of locality which, according to the same eminent traveller and philosopher, tend to counterbalance the former, and thereby contribute to lower the annual mean temperature. But, on close examination, it will be found that the causes of calorification preponderate, and that from their agency, aided by other circumstances, the country derives the mild climate for which it has ever been noted. More than any peninsula in Europe it is intersected by gulfs, surrounded by seas, and covered with rivers and lakes. The width of the territory, from the Mediterranean to the Adriatic, is of limited extent, and the whole surface, from the foot of the Apennine to the margin of the former sea, is consequently freely exposed to the action of the western influences, which tend to raise the temperature. That the heat should be more notably felt on the western than on the eastern side of the Apennine is easy to conceive, when we bear in mind that the former is more open to the agency of westerly winds, which preponderate in the zone of mid-

dle latitudes in both the northern and southern hemispheres, and effectually raise the temperature during the winter season; that these winds are, from the extensive barrier of the Apennine stretching from one extremity of the peninsula to the other, protected from any serious antagonism; that the topographical conditions on that side are such as to favour the admission of those winds, and of those proceeding from the south; that the soil has been very extensively cleared, and is thereby enabled to feel, in a direct manner, the action of solar heat; that from the serenity of the sky during the summer months, no obstacles are thrown to the direct calorification of the earth, of the watery surfaces, and of the lower strata of the air; and that, to some though limited extent, the influence of the southern stream which produces such heating effects on other parts of the European coast—that of the Gulf Stream—is felt on the western side of Italy. To this it may be added that the other coast is less indented, and its depressions are less extensive; that while the Apennine protects the Mediterranean side from the influence of northerly and easterly winds, which have free access on the other, the same chain secludes, in great measure, at least, the Adriatic zone from the genial effects of southerly and westerly breezes, and that this side is exposed to the influence of a large continental surface, deprived of sea, and extending uninterruptedly to the polar region.

Two isothermal zones pass over the Italian peninsula—the one more southern extends between the 59th and 68th degrees of temperature of Fahr. (15° and 20° Cent.); the other, which is northern, extends between the 50th and 59th degrees (10° and 15° Cent.). The first, or warmer zone, is bounded on the south by the African shore of the Mediterranean, and on the north by a line which, on its exit from the Atlantic, passes over the superior frontier of Portugal, the sub-Pyrenean regions of Spain, the ancient province of Roussillon, and a portion of the coasts of France and Liguria; next cuts across the Italian peninsula, above Rome, somewhere about the frontiers of Tuscany, and after passing over the Apennine suddenly extends to the Adriatic. The second zone, which is colder than the former, includes the upper region of the territory, from the limits traced above Rome to the northern and western confines of the Milanese. It is that under which are placed France and the southern portion of the Britannie group. By this arrangement we arrive at a knowledge of the extreme limits of the temperature. The higher or warmer zone passes over the African coast, the colder to the north of France and Germany. The mean temperature in the former does not exceed 68°, while the mean in the latter does not descend so low as 50°. Nor is this all. The isothermal line which divides the warmer zone from the colder, after crossing the Apennine, inclines suddenly towards the south before extending to the sea, thereby leaving behind it a large territorial surface consisting of the regions bordering the Adriatic. The isothermal line divides, therefore, the eastern zone of the peninsula into two sections, the mean temperature of one of which must be higher than that of the other—an effect due to a difference in the character of the winds that prevail; the northeast, cold and dry in the one; the southeast, hot and damp in the more southern section. In the eastern, or Adriatic zone of the peninsula, the difference between the isothermal and isochimeneal lines, or of equal summer and equal winter heat, is much greater than is found to be the case on the Mediterranean or western side of the Apennine. Thus at Bologna, which, in the former, occupies a central position between the superior confines of the Lombard kingdom and the northern frontiers of the Neapolitan States, the mean temperature in winter is 35° F., and in summer 77°; while at Lucca, which is in nearly the same

latitude, but on the western side of the Apennine, the mean temperature in winter is 40° (4.6 Cent.), and in summer 74° (23.6 Cent.).

On the western side of the peninsula the isothermal line assumes a rather different course. We have seen that the line which separates the southern from the northern zones passes above Rome, and after having crossed the Apennine inclines suddenly towards the south. In doing so it describes a curve, which encloses within its concavity the whole of the Gulf of Genoa, the territory of Lucca, Tuscany, and the rest of Italy. Hence, whilst on the western side of the Apennine, this isothermal line, by ascending southwardly, expands the region of high temperature, on the other, or Adriatic side, it gives rise to contrary effects, for, by descending towards the south it diminishes the limits of the hot region. It may be remarked, in conclusion, that, however widely the various places in this section of the country may differ in regard to latitude, they approximate closely in respect to their winter and summer mean temperatures. Naples presents a mean temperature in the former season of 50° (9.9 Cent.), and in the latter of 74° (23.9). Rome gives 47° (8.3) in winter, and 73° (22.9) in summer. Lucca, as already seen, exhibits a winter temperature of 40° (4.6) and a summer temperature of 74° (23.6); and finally, the thermometer at Nice gives 49° (9.3) in the former season, and 72° (22.5) in the latter. This analogy of temperature in places so distantly situated from each other must, of course, depend on the preponderating influence of some general agency, which Dr. C. very properly traces to the southerly winds.

It is a fact too well understood to need illustration in this place, that a humid and hot constitution of atmosphere, particularly in the vicinity of the sea, is attended with the development of electric and meteoric phenomena. Dry heat accumulates electricity in the higher regions of the atmosphere; a humid state of the air, on the contrary, attracts it to the surface of the earth. The details into which we have entered relative to the western territory of the Italian peninsula show that it is particularly well disposed to promote the manifestations of those phenomena. The Mediterranean, from the numerous and extensive irregularities of the coast, penetrates deeply inland and forms a series of inland lakes, which present very extensive surfaces to the action of the atmosphere; while the country abounds in lakes and marshes. These surfaces exercise an active agency in promoting electrical communication between the inferior and superior strata of the atmosphere. The same effect is powerfully aided by the numerous peaks and sharp points by which the central mountain chain is characterized, and which perform the office of condensers; while the volcanic constitution of the soil naturally tends to increase the development of the fluid. From this development, which manifests itself in various ways and in various degrees of intensity, necessarily result effects more or less evident on the population exposed to its influence. Hence in every part of the western coast—with the exception of high and mountainous districts—the effects in question are strikingly observed. Thus, as Dr. C. remarks, if we visit Naples, or Rome, or Florence, and inquire into the physiological and pathological conditions of its inhabitants, we shall find that the nervous system plays the principal part in the acts of life, and that the activity of the function of innervation is carried beyond the limits of health.

He remarks that he had occasion to see, at Naples and Florence, individuals who exhibited curious examples of nervous disorders unknown in France and in the north of the European continent; and that, in investigating the general physiognomy of the most common disorders, he was not surprised to find that the principal element appertained to the domain of sensibility.

"From this we would infer that the climate of the western zone of Italy is one of nervous agitation—of organic perturbation—from which the inhabitants suffer, and the sick should be shielded."

Fortunately these inconveniences are not constantly carried to a very great extent; being temporarily checked or diminished by particular conditions of the atmosphere. Violent storms, which in certain seasons are of frequent occurrence, spontaneously dissipate violent electric tensions; while the vesicular vapour which is almost constantly present in the air acts as a drain, which keeps up a sort of equilibrium in the high regions of the atmosphere, and thereby prevents, in ordinary times, the effects from being unduly felt.

It has thus been seen, that Italy, considered in a climatological point of view, may be divided into two regions or zones, separated from each other by the Apennine chain. The western receives the influence of the warm or southerly winds—the eastern zone is exposed to that of opposite currents. In the former, the evaporation being, from the higher temperature of the atmosphere, more considerable than in the latter, the humidity is greater also, but not of long continuance; in the latter, the heat being of less amount, the humidity is not so great, but continues longer. From these circumstances, there results a difference in the nature of the rains. In the western zone they fall in heavy showers, and only during a single season; in the eastern, they continue longer and are more equally distributed throughout the several seasons. In the former, the atmosphere is more frequently clear than in the latter. In the former, also, the hygrometrical constitution of the atmosphere, the condition of the soil, and the position of the country promote the development of electricity; in the latter or cold zone, contrary conditions prevailing, the electrical developments are less marked. In the former, again, the thermometer, owing to the position of the territory, ranges higher in winter and lower in summer than in the latter; but with more frequent oscillations in the barometer. Finally, the western zone is largely supplied with sources of miasmatic exhalation; while the eastern, though not entirely free from them, are much more favourably conditioned in that respect.

But, although a line of distinction may be fairly drawn between the climates of the western and eastern zones of the Italian peninsula, the differences exhibited are not equally striking in every portion of the territory. A difference in the situation of places, or in the relative position of the seas or continents, occasions not unfrequently in their climate a new source of influence by which the latter is more or less modified, and made to approximate that of localities distantly situated. This is exemplified on both sides of the Apennine.

"In the portion of the Adriatic coast forming the extremity of the peninsula, the atmosphere is under the control of the S. and S.E. winds. This region is almost as warm as the surface along the coast of the Mediterranean. This condition prevails as far as the Gulf of Manfredonia, at which point much greater changes occur. The southerly winds continue to prevail; but those from the E. and N.E., and even from the N., begin to predominate. As we advance northwardly, this predominance increases, until it finally becomes complete, and thereby lowers the annual mean temperature. On the western coast, the character of the influence changes at the angle formed by the Apennine above the Ionian Sea. As we ascend along the Calabrias, it becomes more marked; it does so even higher, notwithstanding the occurrence of the N.W.—the *maestro* of the Italians. Finally, in the plains of Latium, and on the coast of Etruria, the influence of the southerly winds becomes modified; not so, however, with respect to the W. wind, the intensity of action of which has not diminished. But, when the Apennine and the coast suddenly assume another and different direction, and instead of proceeding from south to north, do so from east to west,

the southerly winds again become predominant, and conditions analogous to those existing before are re-established."

Having entered fully on the climate of the western and eastern zones of Italy, Dr. C. passes to the consideration of that of the three divisions he has made of that country, the Southern, Central, and Northern, and of the different important cities they contain; premising some general remarks on the atmospheric condition and topography of each of those divisions. Nor is this division purely arbitrary. It is justified by the difference observed in the sky of the southern provinces of the central territories of the peninsula, and of the continental regions of the Milanese. Equal differences are discovered in the products and modes of cultivation of those different parts, as well as in their temperature. Interesting and important, however, as this subject may be, ably as the author has treated it, and useful as it doubtless would be to point out the results of his investigations, we have no room to present even a brief abstract of these, and proceed at once to the consideration of the climate of individual cities or districts. But, even in relation to these, we must restrict our inquiries within narrow bounds, and content ourselves with presenting some remarks on a few of those places usually resorted to by invalids, and most deserving of regard in medicinal and prophylactic points of view—Naples, Rome, Pisa, &c.

Naples.—Though the city and basin of Naples are apparently surrounded on all sides, that of the bay excepted, by high mountains, the effect of which may be supposed to shelter them from the active influence of winds from the principal points of the compass, experience shows that the protection they really afford is very limited and imperfect. These mountains are all ancient volcanic cones, whose original shape has been disfigured through the action of time and the work of man. Posilipo, which extends as far as Capo di Monte by successive hills of greater or less elevation, constitutes the most efficient portion of the barrier. From Capo di Monte to Vesuvius, the hills gradually lessen in height, and leave large interstices between them; and it is only at the extremity of the arc, in other words in the region of Vesuvius, that the basin becomes effectually protected. The gulf being open to the S. W. and W., the winds blowing from those points have free access to the quays of the city. If to this we add, that the basin of the latter experiences the effect of those winds that extend over the adjoining hills, and along the edges of the two lateral branches of the Campanian gulf, we shall at once perceive that the atmosphere of the place must be subject to numerous vicissitudes. The bay front of the city being semicircular in shape, the extremities and centre projecting out, it follows that the exposure of these two divisions is not similar, and that the winds which exercise their action upon them are different also—the one being open to the N. N. W., and the other to the S. W. From its exposition and topographical condition, which we cannot particularize here, the former is under the powerful influence of the N. W. wind or *mistral*—which, as we have seen, is the most impetuous and searching of all those that visit the Italian coast. It blows violently along the quays of the Margellina, as far as that of St. Lucia. Posilipo offers an obstacle to the N. wind—the Somma does the same as regards the E. wind; but the N. E. finds admission through the depression existing between Capo di Monte and Capo di China; the S. E. and the S. pass along the sea margin of Vesuvius, or cross the gulf and over the high ridges of Castellamare and Sorrento; and the S. W. and W. penetrate freely into the city from the open expanse of the Tyrrhenian Sea. Hence the less frequent currents are those from the east, the southeast and the north; and the most frequent those that blow from the

sea or along the edges of the gulf. The scale of the proportional influence of those various winds may, according to our author, be stated as follows: The S. W. or *libeccio*, which is predominant at Naples, being represented as 5, the S. will be found to prevail as 3; the N. as $2\frac{1}{2}$; the N. W. as $2\frac{1}{2}$; the W. as 2; the N. as $1\frac{1}{2}$; the S. E. as $1\frac{1}{2}$; and the E. as 1. From this we find that the northern influences stand as 6; while the antagonistic winds stand as 9.

The superiority of action of southerly winds, which, before reaching Naples, pass over water surfaces of great extent, imparts to the atmosphere of that part of the Campagna a considerable degree of humidity. These winds prevail particularly during spring and summer, and continue till the opening of autumn, sometimes as late as winter. But though predominant during that long period, they are so only in a relative manner; being often replaced by the Etesian winds, which, as has been stated, promote the serenity of the sky during the summer, and exercise a great influence over the atmosphere of the peninsula.

Rain falls in greater abundance during the months of October and November. December, during which the north winds prevail frequently, is comparatively free from rain; and January still more so. The driest months are June, July, and August—particularly the first and third—an effect due to the regular supremacy of the Etesian winds. The amount of rain which falls during the course of the year has been differently estimated. M. Cavaseo states it at 950 millimetres, or 38 inches, and De Renzi at 750 millimetres, or 30 inches; while our author thinks the estimates of the former too high, and those of the latter too low. Admitting this to be well founded, we may presume the quantity to amount to 850 millimetres, or 34 inches.

Owing to a variety of causes of a topographical character, the climate of Naples exhibits frequent alternations in regard to the degree of humidity. This fact, which may startle those who, without personal experience on the subject, are familiar with the praises which poets have lavished on that climate, is amply verified by the results of accurate hygrometrical and barometrical observations. Clouds frequently accumulate, rain falls often, and heavy thunder showers are not rare. The changes are sudden and extensive, and vary considerably in the course of a single day; while it may be assumed that the proportion of fine and clear days, comparatively, to those of a contrary character—gloomy or rainy—varies from one-fifth to one-fourth.

If we inquire into the effects on the economy of the more important winds which prevail at Naples, we find that the south-west, though cloudy and rainy, does not impair the energies of the system so effectually as other southerly winds. The south and south-east—the *ostro* and *sirocco*—which present a great analogy to each other in their effects, and penetrate freely into an extensive section of the city, exercise on the inhabitants the enervating influence we have already described. The north-west (the *maestro* of the Italians), which, as we have seen, blows violently along a large portion of the bay side of the city, is cold and damp; and, among other morbid influences, produces a violent and hurtful impression on the skin and on the nervous system.

These unfavourable conditions of the climate, resulting from the causes mentioned, are in some measure corrected or counterbalanced by the elevated temperature of the atmosphere. The annual average height of Fahrenheit's thermometer at Naples may be estimated at 60° (16.5 Cent.); that of other localities of the bay being about 59.5 (15.9). The winter average in the

former is 49° (9.8); that of spring 60° (15.2); of summer 74° (23.8); and of autumn 61° (16.8), or even $62^{\circ}.6$ (17). It is remarked by our author that the difference in the averages of the several seasons not being very considerable, the consequences resulting from it would not be of a serious character, were the transitions to occur gradually. But, if temperature modifies the physiological effects of winds, these moderate or neutralize the effects of the former. In consequence of the manner in which the succession in the course of the aerial currents takes place, they change completely, from morning to night, the character of the climate, producing a sharp dry cold, after having promoted a hot and humid influence. But though from these and other circumstances we may not expect to find the thermometer rising very high, and descending quite low, yet the maximum temperature does not exceed 101° (38.7), while the minimum is scarcely ever lower than 23° (or 5° below zero, Cent.). Naples is subject to those meteoric phenomena which more particularly appertain to northern climates. Ice is common in winter, snow falls not unfrequently, and hail may be regarded as of common occurrence. Finally, the atmosphere is often charged with electricity, and contaminated, in many parts, with volcanic emanations.

From all these circumstances—the frequent atmospheric vicissitudes, the electrical tension, and the impure composition of the air resulting from its admixture with emanations of a stimulating character—there results for the animal economy an influence of a most exciting kind, which increases gradually the mobility of the nervous system, and acts very powerfully on strangers who visit that part of the Campanian territory. But the effects of the climate vary somewhat in the different portions of the city and its environs. The quays from Posilipo to Chiatamone are spacious. At the furthest extremity they extend to the beach; in other parts they are separated from the latter by a garden of great magnificence, *la Villa Reale*. This is the fashionable part of the city, and is mostly frequented by foreigners. The garden, as our author very properly remarks, has the disadvantage of weakening the influence of the west wind, which is cool in summer and genial in winter; but, at the same time, it has the advantage of freeing that part of the city, which is denominated Chiaja, from the more or less perturbing effect of the south-west wind. The west wind reaches more freely that portion of the quay nearest to Posilipo, and which, in consequence, is warmer. The front part of the city, from Posilipo to Sta. Luccia, is under the influence of the cold and damp searching blast of the north-west, which blows along its extensive margin with irresistible impetuosity. It is of much more frequent occurrence than usually supposed; for, during the autumnal and winter seasons—those in which it prevails most generally, though not exclusively—we hazard nothing in saying that it blows more or less continuously during some portion of every fourth day. To delicate temperaments and valetudinarians the effect is highly injurious. It suddenly checks perspiration, occasions acute thoracic affections, and deranges more or less seriously the organs of the circulatory and nervous systems. To individuals in feeble health, and to the sick generally, we cannot too strongly insist on the propriety of avoiding this locality, magnificent and agreeable in many respects as it undoubtedly is.

The part of the city situated beyond the cone of Saint Elmo extends from west to south-east, and is sheltered from the effects of the north wind, which passes over it, as also in great measure from those of the north-west. It is healthy, and would be still more so if kept in a proper condition; but it is objectionable as a residence for invalids, from the too rapid ascent of the streets, and its exposure to the influence of the south-west wind.

In that portion of the city located on the other side of the street of Toledo, which constitutes the eastern and southern districts, and where we must look for the site of ancient Parthenope, the injurious influences are not felt. We need not dwell on this locality, as its narrow, obscure, and irregular streets offer no attraction to, and will naturally be avoided by, travellers and invalids, who, if such were not the case, would be deterred from residing there by the long-recognized insalubrity of the soil. This insalubrity extends beyond the inhabited portion of this district, and manifests itself in the form of intermittents on the outside of the city wall, and on the level surface extending from the foot of Capo di Chino, la Somma, and Vesuvius to the sea. Be this, however, as it may, the eastern and southern portions of the city present some advantages over the northern. Its atmosphere is less oxygenated and less exciting, being free from the influence of the north-west winds; while Vesuvius shelters it from the enervating effects of some of the southerly currents. Its atmosphere does not, like that of Chiaja, suppress perspiration, or affect injuriously the nervous system, or the organs of the pulmonary and circulatory apparatuses. It is the zone of chronic, not of acute diseases. Whilst, therefore, invalids, those particularly who are affected with thoracic and neuralgic complaints, must avoid that part of this region presenting the unfavourable characters above pointed out, they may advantageously select another, situated between Capo di Chino and the superior extremity of Toledo, where they will find level streets and imposing and elegant monuments, where the southerly winds prevail with less energy than elsewhere, and where the air is renewed through the healthful influence of the north-east.

But although some benefit might be derived in pulmonary complaints from a residence in this locality, it is doubtful whether the benefit is sufficiently marked to justify the recommendation of Naples as a place of residence to individuals affected with tubercular phthisis; for even the most favoured spots are, to a certain extent, subject to the atmospherical vicissitudes we have noted as forming a characteristic peculiarity of the climate of that beautiful city, and which, as is well known, acts injuriously in this and other forms of pulmonary disease. It is objectionable, moreover, from the exciting influence of the atmosphere—which, as already stated, stimulates strongly the nervous system—as also from the difficulty experienced here of resisting the pleasure of daily excursions to places of interest; a course suitable to few, and which cannot be indulged in with impunity in all cases. “Le séjour de la capitale des deux Siciles ne doit être recommandé qu’aux malades qui n’ont pas besoin de se condamner pour guérir, à la retraite et à l’inaction.” The opinion of our author on this subject is not different from that entertained by Sir J. Clark, who, after condemning the climate for consumptive patients, remarks that it is well suited for those who are labouring under general debility and derangement of the constitution without any marked local disease.

Dr. C. agrees with De Renzi and others in regarding some parts of the Bay of Naples as appropriate places of resort for phthisical patients, and as preferable in that respect to the city itself. In speaking of Puzzuolo, the temperature of which is mild and agreeable, he refers to the statement of that Italian writer, who considers the air of this place as highly beneficial in phthisis, especially when the disease is complicated with acute irritation of the mucous membranes of the larynx, trachea, bronchia, and digestive organs. That the environs of Naples have been supposed to abound with that disease—more so, indeed, than Paris and its vicinity, where the disease prevails extensively—is certainly true. It has been shown, for example, in corroboration of this, that while deaths by tuberculization in the hospitals of Naples

occur in the proportion of one to two and one-third of the entire mortality, they are found in the civil hospitals of Paris to be as one to three and one-quarter.* But it should be borne in mind that, whatever may be the unfavourable results obtained in the Neapolitan establishments, such results cannot be adduced against the climate of Puzzuolo, since the sick admitted in those hospitals, and who fill up the list of consumptive complaints, mostly come, not only from Naples itself, but also from other places in the vicinity, where the disease is of very frequent occurrence. The climate of Puzzuolo being of a nature calculated to mitigate, or even remove the symptoms of phthisis, must necessarily produce equally favourable effects in diseases of kindred character, chronic bronchitis and laryngitis, and the like. De Renzi attributes a large share of this beneficial agency to the sulphurous vapours issuing from the soil of these regions, and which, aided by the mild temperature of the atmosphere, impart, as he thinks, balsamic qualities to the latter, and thereby render it useful in the diseases mentioned.

Dr. C. is not less disposed to entertain a favourable opinion of the effects of the climate of Mola de Gaëta in pulmonary complaints, particularly in that form of phthisis attacking individuals of a lymphatic temperament. It is also beneficial in nervous affections, characterized by a tendency to prostration, when it is necessary, while allaying excitability, to impart tone to the system.

Rome.—The climate of Rome and its environs has been the subject of extended inquiry, and occupied the pen of many native and foreign writers. Dr. C. has examined it somewhat in detail, both in a general and medical point of view, and has more accurately than any of his predecessors, as we think, indicated the peculiarities by which it is characterized, the causes of these peculiarities, and the physiological, pathological, and medicinal effects to which they give rise. But in doing so, he has enlarged on many points of a topographical nature, which, though highly useful and interesting as well as necessary towards a clear elucidation of the subject, are somewhat foreign to the object we have in view; and must, therefore, be passed by unnoticed. The Rome of modern times is not located on the same surface as the Rome of former days. It occupies the site of the ancient Campus Martius—to the north of the other; while the City of the Emperors was situated on the seven historic hills, and on a plain which extends in a southerly direction, and is now almost deserted, and more or less covered with ruins. The position of the old city was highly unfavourable to health. The surface upon which the population thronged commences at the southern extremity of the Coelian and Esquiline hills. It inclines in an eastern and northern direction, passes behind the Viminal and Quirinal, and, extending beyond the gates of St. Jean Lateran and Sta. Maria Maggiore, stretches nearly as far as the hills of Albano and Frascati. The city was exposed, therefore, to the free action of the south and east winds, the effects of which were not counterbalanced by those of the northern currents, whose access was in great measure impeded by the mountainous ridges situated at the back part of the plain, and which were at the time covered with thick forests. From this the temperature of ancient Rome must have been higher than that of the present city; and this excess of heat, operating on a surface covered with marshy pools and stagnant water, and consisting of a volcanic and imperfectly consolidated soil, accounts for the insalubrious nature of the city. This injurious effect was doubtless in great measure corrected by the draining of the soil and the erection of

* *Journal, Recherches Statistiques sur la Phthisis en Italie*, Bul. de l'Ac. de Méd., vol. iii. 342.

aqueducts and analogous monuments; but the result was not entirely successful.

The Rome of modern times presents conditions of a very different character. Though enclosed on the east by the Pincian, Quirinal, and Viminal hills, and on the west by those of the Vatican and Janiculus, the valley of the Tiber is not completely sheltered on either side from the influence of the winds blowing from those directions. At the same time, owing to the position of other hills and distant mountains, the south winds, which, as above stated, had free access to the ancient city, reach the modern with some difficulty, being in a measure impeded in their course by the Capitoline and Palatine hills, and other irregularities of the soil. From this, and from the fact that the northerly winds have a freer access to modern than they had to ancient Rome, we find an additional reason for inferring that the temperature of the former is lower than was that of the old.

The condition of the soil of the Campus Martius, which is now covered with streets, was, and is now in some of its parts, of a character suitable to the production and accumulation of humidity. Low and flat, and bordering on the Tiber, it was, and is still to a certain extent, subject in particular seasons to overflows. That part of it which was called the Velabrum, and from the nature of the commerce to which it was appropriated, received the name of *Forum Boarium*, was regarded in ancient times as highly insalubrious. It forms a connecting link between the old and the modern city, is occupied by the lowest classes of the population, is characterized by narrow streets, irregular pavements, and a defective level, and is now as unhealthy as it was in former days. The insalubrity of the surface upon which the city stands has been greatly lessened. Purified by Leo the Tenth, the soil was soon covered with streets; churches and houses were multiplied; and, before the close of the reign of that pontiff, the population amounted to 60,000. The narrow valley between the Tiber and the foot of the Pincian hill, by which we now enter Rome, was transformed from a vast marsh into the beautiful Piazza del Popolo; and other quarters were, by succeeding pontiffs, greatly ameliorated.

The city is abundantly supplied with water of good quality, not by twenty-four aqueducts, as in ancient times, but by three—those of the Aqua Vergine, the Aqua Felice, and the Aqua Paolo; and though the supply—9,025 inches (French), or 180,500 cubic metres in the twenty-four hours—would not have been sufficient, had the inhabitants retained the habits of bathing for which their ancestors were noted, it is amply so for drinking and ordinary household purposes.

We have stated that the north winds have free access into the city, and that those from the south are in a measure impeded in their course. This impediment is not so effectual, however, as to prevent them from preponderating over the former. The direct opposition in the several points of the horizon whence are derived the prevailing winds accounts for the sudden transitions which occur in the anemological conditions of the atmosphere. These transitions are less frequent during the day than in the morning and evening. During the former period, the south winds prevail; during the latter, though particularly in the morning, the antagonistic currents have the ascendancy. Calandrelli states the proportions of warm and mild winds—S. E., S., S. W., and W.—to be 62 in 100. Other authorities give analogous results. But this law of preponderance is not absolute, the northern winds being in some years more frequent than the others. According to the Italian writer just cited, the most frequent wind is the *Africus*, or southwest, which reaches Rome by

Albano, Ardea, or even the sea. Next in point of frequency appears the south wind, then the north-northeast, next again the southeast, or *sirocco*, and lastly, the northwest, or *mistral*.

The preponderance of damp over dry winds imparts to the climate of Rome hygrometrical conditions of a marked character. Everything contributes to this effect—the position of the country—its exposure to the influence of a large expanse of sea—the river, and its periodical overflows, and the condition of the surrounding surface. We have already referred to the immense amount of water carried to the various sections of the city by means of aqueducts and subterraneous canals. At present the quantity which reaches it does not amount to more than one-sixth part of that obtained formerly, while the largest share of the balance has been lost, and has contributed to the formation of marshes or lakes, with which the depressed portions of the soil of the surrounding country are studded, and which tend to keep up a humid state of the atmosphere. At Rome, indeed, the hygrometer seldom indicates a state of complete dryness. Rain falls to the amount of a little over 32 inches (29 inches French). The average number of rainy days in the year, in a series of 39 years, is 114; the minimum being 58 (1828), and the maximum 158 (1784).* The number of clear days, or those in which the sun shines, is tolerably large. In 1784 it amounted to 58, in which the sky was perfectly clear; while that of cloudy days was 98. In 1828 there were 84 of the former and 45 of the latter. The atmosphere at Rome is far from being so clear and brilliant as at Naples and in Calabria—the light being mellowed by the existing humidity. The high temperature in the city and environs is promoted by the topographical disposition of the country, which is mostly enclosed by a semicircular chain of mountainous ridges, but open in a western and southwestern direction, by which access to the warm and humid currents is allowed. Were it not, indeed, for the antagonistic influence of the north winds, the thermometer at Rome would attain a very considerable degree of elevation. As it is, the prevailing heat is equal to that of more southern regions; the city occupying the same isothermal position as Gaëta, Naples, and Calabria. In a series of twenty years the mean annual temperature was found to be 60° (15.46 Cent.). Winter gave 47° (8.01); spring 58° (14.29); summer 73° (22.91); and autumn 61° (16.49). From this it will be seen that the difference between winter and spring is not so great as that between spring and summer; while the difference between summer and autumn approximates closely to that between spring and winter. The maximum heat is 100.4 (38°); the minimum 23° (5.9 below zero), showing an oscillation of near 77° (44). Hence Rome presents very hot, and sometimes very cold days. The Soracte, “the giant of the Roman horizon,” is almost every year covered with snow. Ice is often formed, and in the winter of 1812–13 was thick enough in the lake of the Villa Borghese, to bear the weight, during several days, of numerous skaters. Snow falls, on an average, one day in every year. In 1784 it did so during five days.

It follows, from what precedes, that, notwithstanding the intense heat and sharp cold of some days of summer and winter, the atmosphere of Rome is rarely extremely dry or extremely humid. Our author has, in imitation of Sir James Clark, noted this quality of the Roman climate, and, like that distinguished writer, ascribes to it the superiority which the air of that city possesses over that of other localities of Italy and France. But this advantage

* In 1826 it was 82. There were 30 days of fog.—*Giornale Arcadico*.

is in some measure counterbalanced by the frequent thermometrical and hygrometrical depressions which occur in that climate—changes which have been noticed from time immemorial, and caused the climate of Rome to be accused of inconstancy. Fortunately, however, the physiological effects resulting from them are not so great and injurious as might have been anticipated, and are in part corrected by the peculiar condition of the air; for, notwithstanding the real depressions of the hygrometer, the peculiar mellowness of the atmosphere does not disappear completely, and the impression it produces continues to be felt, though often feebly, even in the coldest days of winter, by individuals whose constitutions are unused to the influence of cold latitudes. Such changes occur particularly during the first weeks of winter. After December, northern influences predominate, and cold and dry winds prevail; but they seldom continue more than a few days at a time, and are succeeded by others of an opposite character. Towards the close of February, cold days become less frequent, and spring, which is very precocious, opens in April—sometimes as early as March. This season, which in many respects resembles the summer, approximates, however, closer to winter as regards the mean temperature. The transition becomes more sensible toward the close of May or the beginning of June, the former of which months is sometimes very hot. During June and July, the force of evaporation attains its highest point, and meteorological changes are very frequent, as manifested by a clear and dry atmosphere, alternating with showers of rain, attended with electrical phenomena. This is the season of the *Cattiva aria*, which continues till September, when the heat diminishes in a notable manner, or even till October, one of the pleasantest months of the year, and the favourite among the Romans. Finally, November bears some analogy to October, while December is characterized by an alternation of heavy rains, and sharp, cold weather.

In former days, that part of Rome on which the population was accumulated, and which is now almost deserted, was healthy—comparatively so, at least; while the insalubrious sections were the *Campus Martius*, the *Velabrum*, and other parts bordering on the river—the site of the modern city. Whether this freedom from fever in the old city arose from a positive degree of salubrity in the soil, as has been thought, or whether the change has arisen from the operation of natural or accidental causes; or whether, again, the difference is to be accounted for, as is done by Brocchi, by the greater power of resistance possessed by the ancient inhabitants, and arising from more robust constitutions, and better habits and customs, are points which, though interesting, cannot be enlarged upon here. Be it as it may, the reverse is now the case; for, as we approach the inhabited parts of the present city, through the space separating St. John of Lateran from the Forum and the *Velabrum*, we pass over the principal focus of the pestiferous exhalations. On the other hand, the surface of the *Campus Martius*, or even the whole valley, is free from this tainted atmosphere. The very section appropriated to the Jews—the Ghetto, where the precepts of public hygiene are sadly neglected—is comparatively healthy. The only exceptions to this freedom from the fever are to be found in the *Velabrum*, in the district of St. Peter, and on the surface extending from the river to the foot of the *Janiculus*—the latter of which seem, however, to derive their insalubrity from the miasmata exhalating from the soil of the ancient city, and which reach them with facility through the agency of the south winds.

On the bad air (*aria cattiva*) of Rome and its environs, a subject which has occupied the attention of many native and foreign physicians, from the

days of Lancisi to our own,* Dr. C. enters somewhat fully in a separate chapter on the Pontine and the Tuscan marshes, and more briefly in that devoted to the city itself. Without going so far as Lancisi and his followers in regard to the nature of the cause of that bad air, he seems disposed to reject the theory of Folchi, Santarelli, and others, who refer the effects observed to the mere action of thermometrical and hygrometrical vicissitudes; and advocates the opinion of the agency of an organic matter variously combined with sulphuretted salts, and promoting by its presence the decomposition of such of these as may be contained in the water, and the consequent evolution of the deleterious agent, which he supposes to be sulphuretted hydrogen. It may not be improper to remark, while on this subject, that the theory which ascribes fever to the morbid operation of this cause, and which had found advocates in Europe and this country long before our author thought proper to uphold it—Drs. Daniell,† Gardiner,‡ Melier,§ &c.—is supposed to derive support, so far at least as regards Rome, from the extensive exhalation of this gaseous fluid issuing from the soil. Such an exhalation is easily detected, if not everywhere about, at least in many parts of, the campagna and in the Pontine marshes. The odour by which it is characterized is rendered still more perceptible when the soil is, by any means, uncovered. This exhalation (as also that of carburetted hydrogen) has been noted by various investigators, and dwelt upon by resident physicians in their explanation of the causes of the diseases incident to the country. Dr. Gonel, who practiced for many years at Rome, lays particular stress on both in some valuable MS. notes furnished by him to Dr. Valentin,|| and remarks that the olfactory nerves and respiration are often greatly incommoded by them.

The same observation has been made in the adjoining country, and finds a ready explanation in the circumstance that Rome is surrounded by extinguished volcanoes, and that the basin in which it stands was in all probability of like nature. Mr. Riccioli, who performed most of the experiments recorded by Brocchi in his excellent work on the soil of Rome,¶ confirmed, in conversation with the writer of the present article, all the conclusions to which that eminent author had arrived. They could never, it is true, detect any extraneous principles in the atmosphere of the insalubrious regions; and animal substances were not found to putrefy sooner in such regions than in damp localities situated within the healthy quarters of Rome. Yet, while averring these facts, which correspond closely with those observed elsewhere, Mr. Riccioli confirmed, to a certain extent, what Dr. Gonel stated to Dr. Valentin relative to the escape of gaseous fluids from the shores of the Tiber.

* *Lancisi*, De nativis dague adventitiis Romani cæli qualitatibus. *Ib.* De noxiis paludum effluviis. *Doni*, De restituenda salubritate aeris Romani. *Cognati*, De Romani aeris salubritate. *Perri*, Ragionamento al popolo sulle cagioni delle morti improvvisa frequentemente accadute in Roma. *Michel*, Recherches médico-topographiques sur Rome et l'Agro Romano. *De Mathais*, Ratio instituti clinici Romani in præfatione. *Brocchi*, Esperienze sull' aria cattiva dei contorni di Roma. *Folchi*, Considerazioni sopra un articolo Inglese riguardante un'opinione particolare del Sig. Brocchi (Giornale Arcadico Gennajo, 1823). *Folchi*, Sulle origine delle febbri intermittenti in Roma e sue campagna. *Micara*, Della campagna Romana e del suo risoramento. *Minzi*, Sopra le generi delle febbri intermittenti specialmente di Roma e della sua provincia australe. *Santarelli*, Ricerche intorno alla causa della febbre perniziosa dominante nello Stato Romano. *Thouret*, Traité sur le climat de l'Italie.

† London Med. Gaz. vol. xxviii. p. 669 (1841).

‡ Am. Journ. of Med. Sci. N. S. vol. v. p. 279.

§ Rapport sur les Mairies Salans, Mém. de l'Académie de Méd. vol. xiii. p. 611, &c.

|| Valentin, Voyage Médical, p. 98.

¶ Dello Stato Fisico del Suolo di Roma.

He collected, in 1818, large quantities of carburetted hydrogen, in various spots along the river, and found that it escaped from the edge of the latter, and even, in some places, as far out as twenty feet from the shore, but never from the dry land itself. The results of these experiments were subsequently published by Dr. Morrichini* (Professor of Chemistry at the Sapienza), who analyzed the air obtained.

M. Riccioli inclined to the belief that deleterious gases may escape from the soil by means of crevasses or other openings—natural or artificial—and that when mixed with the atmosphere they may, though producing febrile diseases, escape detection. But this he merely offered as a conjecture, and acknowledged that the experiments made by him, with a view to ascertain its correctness, had led to no satisfactory results. The same intelligent naturalist was, like many others, of opinion that cultivation would ultimately cure the country of the pestilence under which it now so severely suffers. We state these facts without laying much stress on them ourselves, so far as relates to the causation of fever; for, were this the proper place, it might be shown that neither carburetted nor sulphuretted hydrogen is adequate to the effect in question—existing in large quantities where fever is scarcely seen, and being absent in localities proverbial for their insalubrity.

The Pontine marshes have often been regarded as the source of the fever of Rome and its immediate environs. Dr. Carriere himself seems disposed to lean to this belief, or at least to think that they contribute, to some extent, to the production of that effect. For our part, we can discover no just reason for coinciding in that opinion. In the first place, it may be remarked that the marshes in question are separated from Rome by a chain of hills, on the south slope of which are situated the towns of Velletri, Genzano, and Albano, and the villages of Nemi and Aricia. These are all peopled by a robust and hardy race, little, if at all, subject to the morbid effects of the *aria cattiva*. Now, to suppose that the Pontine marshes extend their hurtful agency to the plain and suburb of Rome, we must admit also that, while such is the case, the exhalations issuing from them pass over the chain of hills in question, without injuring the inhabitants of these towns and villages, in order to exercise their baneful effects at a distance of several miles from the latter. Nor is this all. If we adopt the theory in question, we shall be called upon to explain how the *aria cattiva*, if it come from the Pontine marshes, happens to spare elevated spots in and about Rome—the Quirinal, for example; while it exercises a deadly action in low places—as the Villa Borghesi—situated in the same direction as, but beyond, the former, and which ought, were such theory correct, to be protected by them.

Neither can we suppose the fevers of Rome to arise from exhalations issuing from the marshes of Mecaresi, Porta, and Ostia. These are comparatively small, and at a distance of six leagues from the city, and, besides, separated from it by the wooded and cultivated hills of Monte Verde, as well as by the Janiculus and Vatican, which ought to prove a sufficient obstacle to the diffusion of the morbid cause, supposing it probable for the latter to be wafted from those localities. The other marshes of Pontano and Regillum, in an eastern and southern direction, are by far too small to be chargeable with the effect in question. In a northern direction, the environs of Storta, of Isola Farnese, and, indeed, all the Veientine territory, are sickly, though not under the influence of marshes or stagnant pools; and, if the disease can there prevail independently of such sources of exhalation, we can

* See letter to Brocchi in the *Giornale Arcadico*, vol. viii. p. 2.

have no reason to deny that such may also be the case at Rome, and that in most of its districts where the fever appears it is evidently due to the action of local causes, and to the vicissitudes of temperature, aided, as exciting causes, by exposure to night-air, the action of dews, &c.

Dr. C., like many others, regards Rome as one of the best medical stations of the peninsula for persons labouring under pulmonary tubercles. This moist atmosphere, he remarks, in which the humidity is never carried beyond proper limits, and in which the temperature—except at certain periods, the return of which may, from their regularity, be foreseen—never changes abruptly, has the effect of immediately ameliorating the irritation of the lungs. To this, however, he adds that the climate is not suitable to all periods of the disease. When prostration is not carried very far, it acts favourably, by calming and diminishing irritation; in the contrary case it acts as an additional cause to the existing prostration, and under its influence the remaining strength may diminish very rapidly. Sir J. Clark, in like manner, found it beneficial in the early, and injurious in the latter stage. Pure tubercular consumption is not of very frequent occurrence at Rome, the greater number of chronic pulmonary complaints being the effect of common inflammation. Acute inflammations of the lungs are frequent, violent, and rapid, and Dr. C. thinks that the climate favours the occurrence of hæmoptysis, which in the advanced stage of phthisis is, as is well known, a very unfavourable complication. The most proper time for having recourse to the Roman climate is about the close of winter or the opening of spring, or again, about the beginning of autumn, and especially during the magnificent month of October. What has been said of tubercular affections of the lungs applies equally to kindred diseases. When the irritation is connected with a fair degree of strength, the climate is beneficial; under contrary circumstances it is hurtful and must be avoided. It acts favourably in rheumatic diseases, in chronic affections of the skin, and in all complaints which call for a prolonged continuance of high temperature. It is also recommended in nervous disorders of the digestive organs. Dr. C.'s remarks accord with those of Professor De Matthæis, Sir J. Clark, and others, as to the peculiar sensibility of the nervous system among the inhabitants of Rome, especially females; as evinced by a disposition to convulsions, and a morbid sensitiveness to perfumes; a peculiarity which could not have prevailed in the days of Horace, from whom, and from Plutarch, we gather that the Romans of old were fond of flowers. Indeed, the change must have been of comparatively recent date; for Panorolo, who lived about the eighteenth century, recommended them, as well as musk and amber, to be placed in sick rooms for the purpose of purifying the air.

Pisa.—Few cities of the peninsula, as our author very properly remarks, enjoy a more ancient and well merited renown, in a medical point of view, than Pisa. This renown, far from diminishing, has increased in proportion as experience has disclosed the effects of the climate; and at the present day, there are few patients affected with tuberculization of the lungs who, after trial, do not attribute to it a more beneficial influence than to that of more southern or western localities. That this preference is, in the main, founded on the peculiarities of the climate, there cannot be a doubt; but we are disposed to attribute weight to the opinion of those who refer it, in part at least, to the influence of other causes. Etruria may justly be regarded as one of the finest regions of Italy; the environs of Florence are delicious; the valleys leading from the Etruscan capital to Pisa present a succession of tableaux full of charms and animation; the baths of Lucca and Pisa complete

the attractions of this territory, to say nothing of the historical reminiscences it recalls, and the beauty of the monuments it contains.

Pisa, as a medical station, owes much to its geographical location, but more to the peculiarities of its topographical character. Situated at the entrance of the last valley of the Arno, the surface extending from it to the sea coast is, for the most part, flat, or devoid of important irregularities. The Arno divides the city from east to west, and in so doing forms a curve, the concavity of which faces the south. This portion of the river side, which by the Tuscans is denominated *Lung Arno*, monopolizes, in consequence of its situation and configuration, during the greater part of the day, the genial influences of the sun's rays, while it is open to the free action of the southerly winds, and sheltered from that of antagonistic currents. It is in consequence the spot selected by invalids, who there meet, in addition to a climate appropriate to their ailments, a degree of tranquillity contrasting greatly with the noisy bustle of Florence and other Italian cities; but which in many cases is essentially beneficial. The sky of Pisa is in perfect harmony with the tranquillity of the city, deprived, as it is, of the sparkling brilliancy of that of southern localities. Rain constitutes an essential characteristic of the climate, and, as such, has been mentioned by poets and historians. It does not fall as in Naples, and in the Roman Campagna, in heavy showers, but in a continuous manner, the quantity being distributed in such a way as to furnish a tolerably large proportion during even what may be called the dry season. The average annual amount is stated by some authorities to have reached above 46 inches, (1 metre 205 m.m.). Taking the annual average of three years, winter has been found to furnish 10.5 inches (255 m.m.); spring 9.1 inches (229); summer 7 inches (175); and winter 19 inches (475); presenting a total for the year of 45.4 (1134 m.m.). From this large amount, and frequent occurrence of rain, it may easily be foreseen that the hygrometer indicates ordinarily a very humid condition of the atmosphere, and seldom points to dryness, and that the barometer shows as seldom the existence of a strong pressure. Nor could it be otherwise. While Pisa is sheltered, in great measure, at least, from the action of northerly or dry winds, by a chain of high mountains, it is open to the southern influences. From this and other circumstances connected with the relative position of the sea and other watery surfaces, it must naturally follow that the atmosphere acquires great humidity; for the winds which predominate necessarily pass over those surfaces before reaching the city; the east and northeast along the valley of the Arno and the lakes of the southern part of the territory of Lucca; the southeast and south over the territory of Leghorn; and the southwest and west over the surface of the Mediterranean.

The mean temperature of winter is estimated at 45° (7.83 degrees Cent.); that of spring, 58° (14.82); summer, 74° (23.23); and that of the autumn, 63° (17.31); giving for the entire year a mean temperature of 60° (15.82). The latter is somewhat higher than the average of Rome, which, as we stated, is 59.5° (15.46); but the mean temperature of winter is somewhat higher in the latter city than at Pisa, as is proved, not only by the fact just stated, compared with the result obtained at Rome; but, also, by a comparison of the average minimum temperature in the two cities during that season. It is to be remarked, however, that though inferior to Rome in regard to the temperature of winter, the inferiority is not felt in every part of the city. It is so outside of the walls, and in those parts that are exposed to northern influences. In some other parts, and especially on the side of the river facing the south, and heated, during the greater part of the day, by the action of the sun, and which,

in consequence, is selected as a place of residence by the sick, the thermometer rises several degrees higher than elsewhere, and gives, during winter, a mean temperature much superior to that of any part of Rome. But, if the climate of the latter city is, notwithstanding the occurrence in winter of cold winds, warmer in that season than that of Pisa, the latter, although relatively colder, is very mild, owing to the predominance of humidity, and the rare occurrence of cold and dry winds. Hence the prostration produced by the two climates is different, and must be referred to the action of different causes. In the one place, it is produced by an excess of humidity; in the other, by an excess of heat.

The mild climate of Pisa, according to our author, diminishes the exaltation of sensibility, and calms pulmonary irritation in certain forms of temperament. On individuals of a nervous temperament, it will act favourably; on those of a lymphatic temperament it will produce a contrary effect.

"This quality of the air, which is efficacious in the first stage of phthisis, and perhaps in the commencement of the second, may become promptly fatal, if the disease has already undermined the powers of the system. In the midst of that silence which enervates by benumbing the faculties, and when under the influence of those causes which relax the fibres and destroy the vital activity, prostration makes rapid strides, and hastens the fatal issue."

This fact is admitted, according to Dr. C., by all the physicians of Pisa, and should be borne in mind by those who recommend a change of climate to phthisical patients. Under other circumstances, and in individuals of a nervous temperament, a different effect is obtained; irritability is calmed, pain is lulled, while the patient enjoys the bodily and mental repose so absolutely necessary for the amelioration or removal of the disease. But while the climate of Pisa produces beneficial effects in some stages of pulmonary consumption, and is, therefore, a suitable place of resort for invalids, Dr. C. remarks that it not unfrequently promotes hæmoptysis even in individuals who had not before experienced that symptom; an effect which he attributes not to any exciting quality in the atmosphere, but to its relaxing effect on the capillaries of the lungs arising from excess of humidity. These cases, however, are of comparatively rare occurrence; and he is of opinion that the complication thus produced may be advantageously combated by a recourse to sulphurous mineral waters. He does not approve of Pisa as a place of residence for such phthisical or other patients as labour under a depression of mind and despondency, and thinks that the quietness and silence of the place would increase this morbid condition, and tend thereby to aggravate the evil.

Before leaving this subject, it may not be uninteresting to remark that in latter times much has been done by the Tuscan government to drain, improve, and cultivate the marshy surfaces and marennes which occupy so large a share of the surface of the country. The results, as regards salubrity, have been of the most favourable character. Fever and other complaints depending on miasmatic exhalations have greatly diminished in regions where they formerly prevailed to a very great extent. In 1840-1, for example, in a population of 103,343, the number of sick was 35,619, with a mortality of 1,316. In 1844-5, the population being 106,833, the sick lessened to 28,148, and the deaths to 986. During the intervening years, the improvement was progressive. As a necessary consequence of this improvement in the salubrity of those heretofore pestilential regions, as also of the favourable changes effected in the soil, the population has greatly increased. Thus, in a period of thirty years, from 1814 to 1843, the population of the province of Grosseto, which was 53,175, has reached the number of 76,179. It is somewhat curi-

ous that the increase in the maremmic provinces has been comparatively larger than in other districts of Tuscany. Thus, in the district of Florence, the increase has been 31 per cent.; in the territory of Pisa, 39, per cent.; in that of Sienna 20½ per cent.; in the Aretine territory 23½ per cent.; while, as we have seen, the increase in the province of Grosseto has not been less than 43½ per cent.

The opinion has long been entertained in England, in this country, and elsewhere, that the atmosphere of fenny or miasmatic countries exercises a favourable effect on pulmonary complaints. Originally maintained, nearly forty years ago, by Dr. Wells,* it has been subsequently adopted by some of our own writers, and by Dr. Boudin† and others in France, and acquiesced in by the author of the volume before us, who adduces some important facts in its support. Judging, indeed, from the statements he makes on the subject, we may conclude that the antagonistic influence in question, which the reader need not be told, so far from being generally acknowledged, has, by high authorities, been positively contraverted, might be illustrated from the results obtained in various parts of the peninsula, and more particularly in the maremmic districts of Tuscany. We have seen that the climate of Naples, where intermittents are rare, is inimical to tubercular phthisis, and favours its development. Admitting, with Dr. De Renzi,‡ that the number of deaths from this disease occurring in that city amounts to one in 12 of the whole mortality; and not to one in 24, as maintained by other authorities§—a proportion larger than that obtained in London and Paris (one in 5 and one in 3½)—we find, on examination, that this mortality, though thus greatly reduced, is still infinitely greater than that occurring in the marshy districts situated on the south side of Naples, as well as in the environs of Puzzuolo and Baia, which are paludal, in Rome and its campagna, in Pisa and in its vicinity, at Nice and other places equally within reach of miasmatic exhalations, and possessing a climate little favourable to the development of phthisis. In the Tuscan maremmes, during the year 1840, the number of cases of that disease was only 25 in 26,786 cases of disease. In 1841–2 phthisis presented a proportion of 27 in 28,138 cases; and the next year the proportion was 48 in 26,807. Thus out of a total of 81,731 cases of sickness, there were 100 cases of phthisis, or one in 817. From this we may perceive that the disease is there of very unfrequent occurrence, and that hence our author is justified in recommending the Tuscan maremmes as a favourable place of sojourn for phthysical patients.

The extent to which these remarks on the climate of Italy generally, and of Naples, Rome, and Pisa in particular, have reached, leaves us no room for examining the condition and medical influences of other parts of the peninsula. All we can do is to say, in a few words, that our author regards the climate of Sienna as useful in scrofulous affections, but hurtful in phthisis. He thinks that of Florence may also be advantageous in scrofulous diseases, characterized by inertia of the system at large, in some form of atonic paralysis, in melancholy, &c., but that it must be avoided by the phthysical. Venice is favourable to the development of nervous complaints; but febrile diseases, which are very common along the Lido and the continental shore, are unknown in the city. The climate acts favourably in phthisis and other affections of the lungs, being mild and exempt from sudden transitions. But, like that of Pisa, it is only useful in the early stage of the disease. The atmo-

* Trans. of Soc. for Improving Med. and Chirurg. Knowledge, vol. iii. p. 471, 1812.

† *Études de Géologie Médicale sur la Phthisie*, &c., Paris, 1845, p. 76.

‡ *Traité des Fièvres Intermittentes, Remittentes*, &c., Paris, 1842, pp. 72–5, &c.

§ *Recherches Statistiques sur la Phthisie en Italie*, Bul. de l'Ac. de Méd. 3, p. 542.

sphere of Menton and its vicinity is useful in the same complaints. It is mild, without excess of humidity; warm but not hot, and free from sudden thermometric and hydrometric vicissitudes. In cases of the disease occurring in scrofulous temperaments, the climate of that little place is preferable to that of Pisa, from a less degree of humidity. The climate of Monaco, on the contrary, is unfavourable in phthisis, but useful in chronic irritations, nervous or inflammatory, of the intestinal canal. That of Villefranche approaches in its remedial influences to that of Menton. Of Nice, which would deserve a more ample investigation than can be bestowed upon it on this occasion, we can only say that its climate differs considerably from that of Pisa, and even of nearer localities, in being less impregnated with humidity, and presenting a greater contrast in the thermometrical condition of the day and night. So far as relates to phthisis, it is, however, more favourable in that form of the disease which occurs in scrofulous temperaments, and calls not only for a mild, but also for a tonic atmosphere. Like Sir James Clark, our author is of opinion, that from a residence at Nice very salutary effects are produced in chronic bronchial diseases. Such patients, says Sir James, generally pass the winter with little comparative suffering from their complaint, and with benefit to their general health. They are here able to work in the open air, whereas if they had remained in England (or other colder latitudes) they would in all probability have been confined during the greater part of the winter to the house. The particular kind of bronchial disease most benefited by a residence at Nice, is that accompanied with copious expectoration, whether with asthma (humoral asthma) or otherwise, and in the chronic catarrh of aged people it is particularly beneficial. R. LA R.